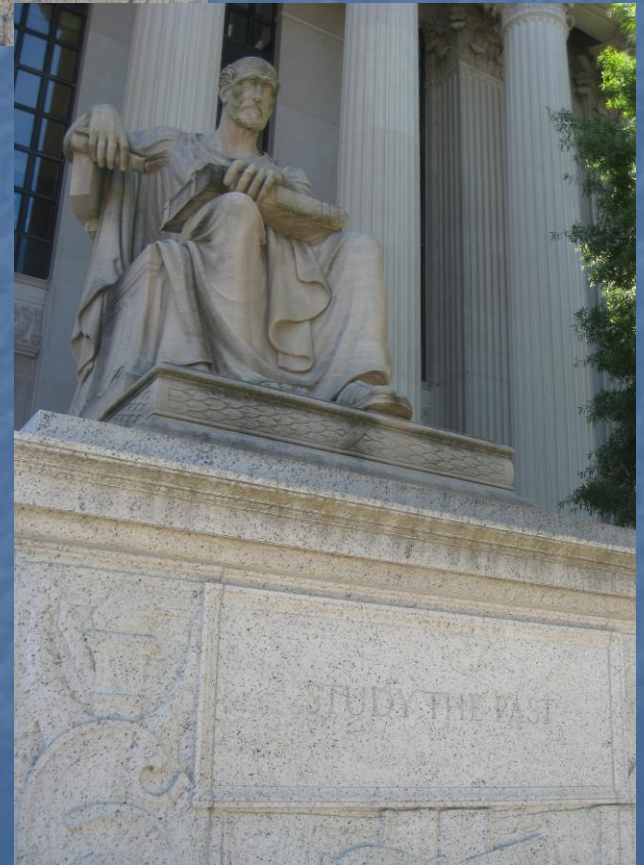
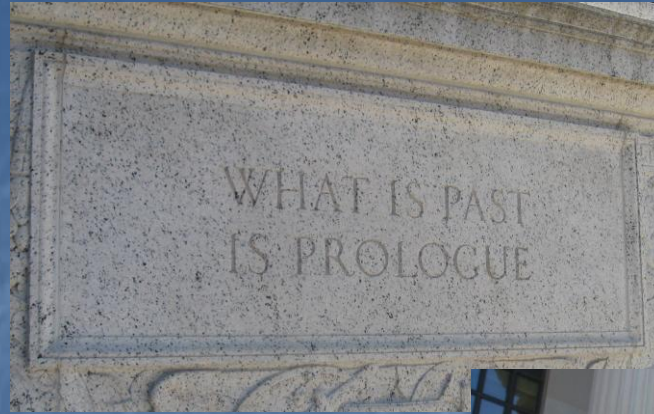


# FOTONES Y NEURONAS: OTRAS PUERTAS DE LA PERCEPCIÓN



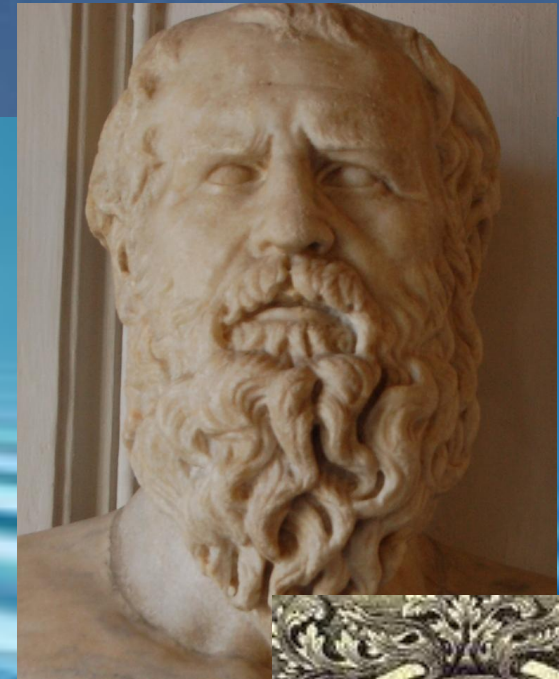
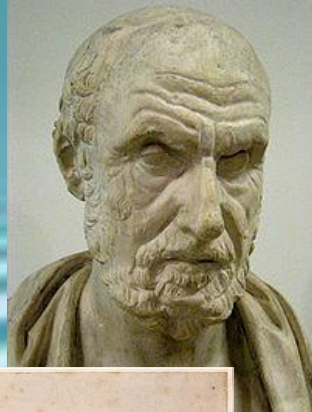




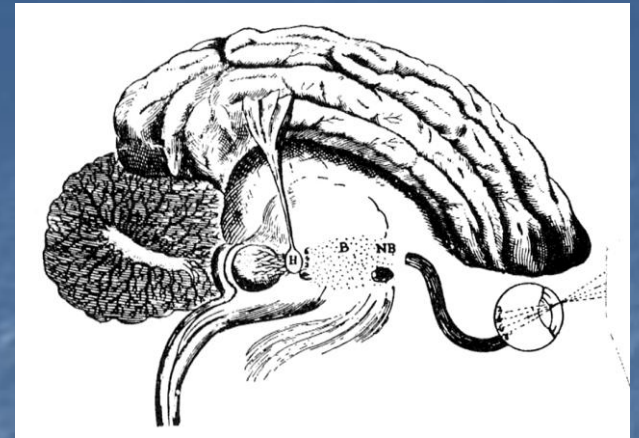
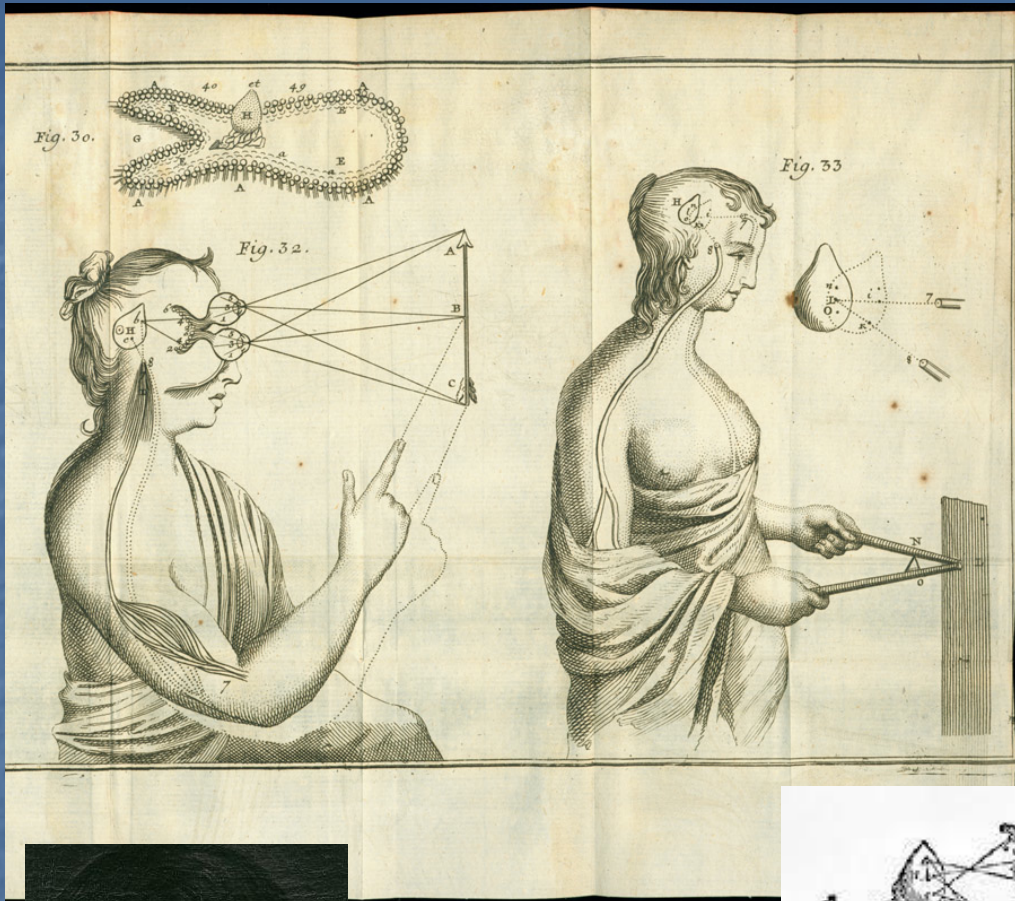


# DE LAS METÁFORAS DEL CEREBRO

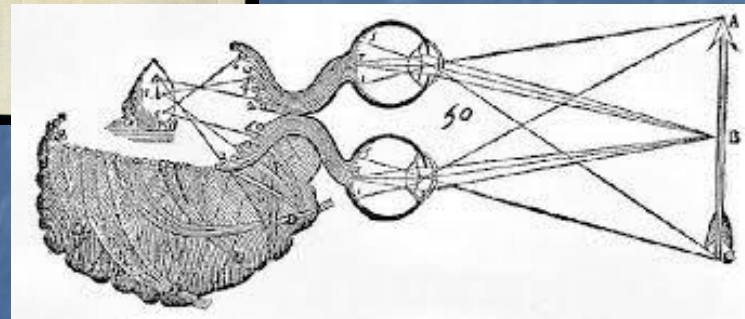




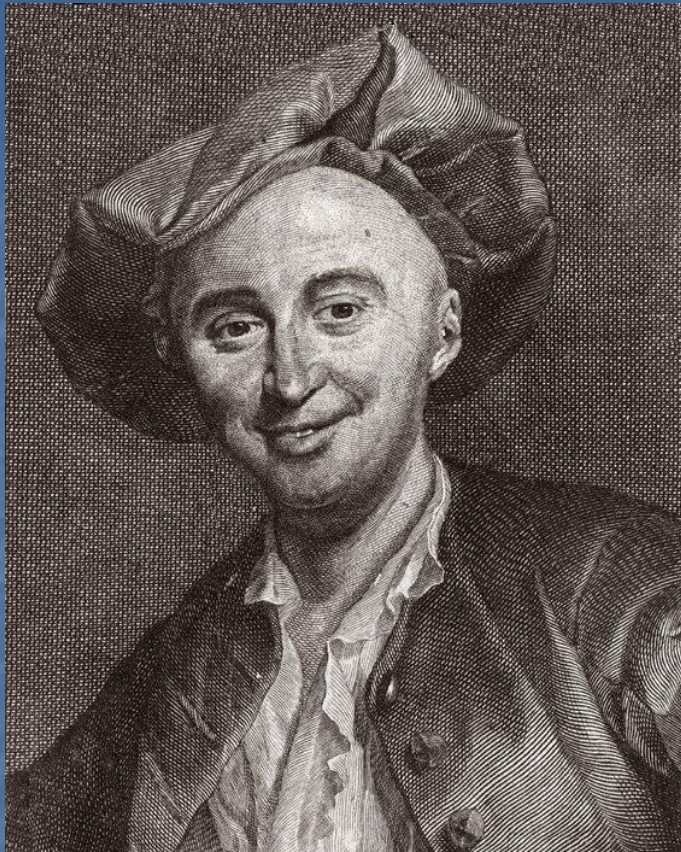




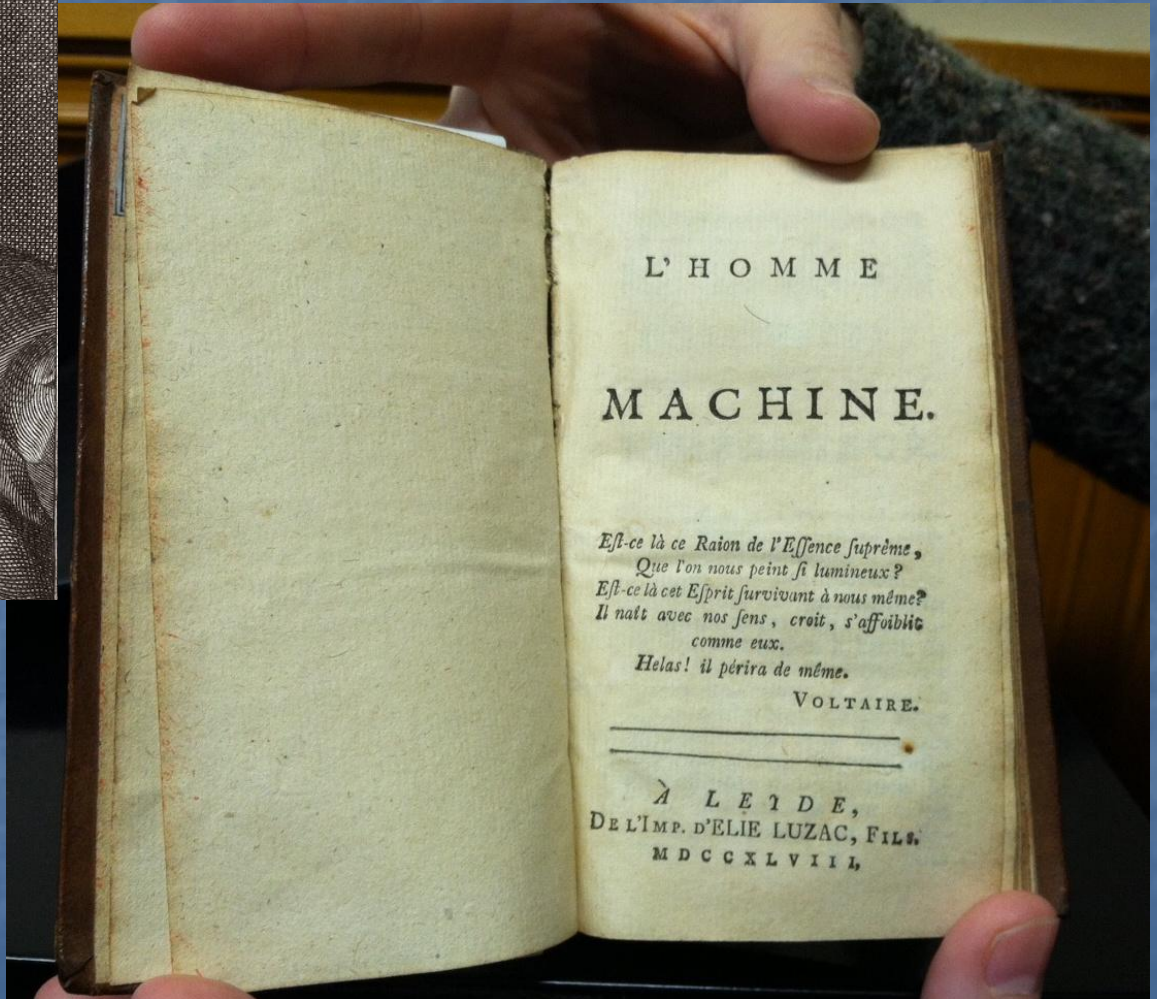
René Descartes  
(1596 – 1650)



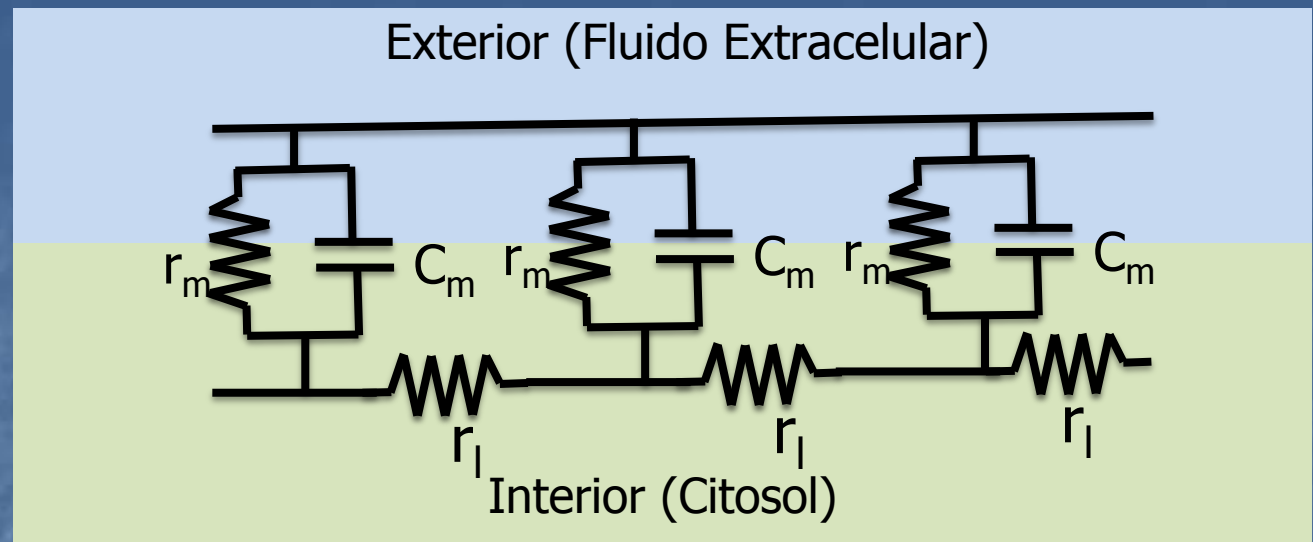




Julien Offray de La Mettrie  
(1709 – 1751)







$r_m$ : resistencia de la membrana  
 $r_m$ : resistencia longitudinal  
 $C_m$ : Capacitancia debida a fuerzas electrostáticas

## ECUACIÓN DEL CABLE

Hodgkin and Huxley, 1952.  
 Premio Nobel, 1963

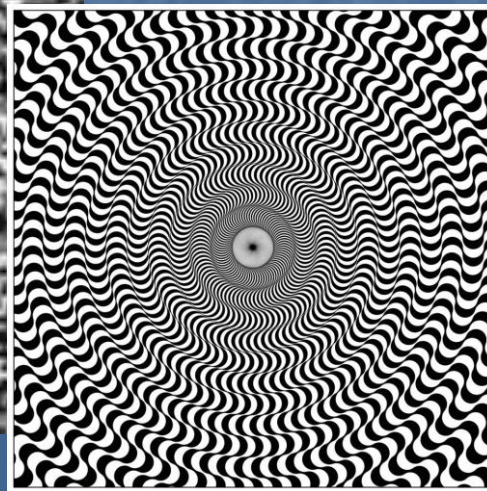
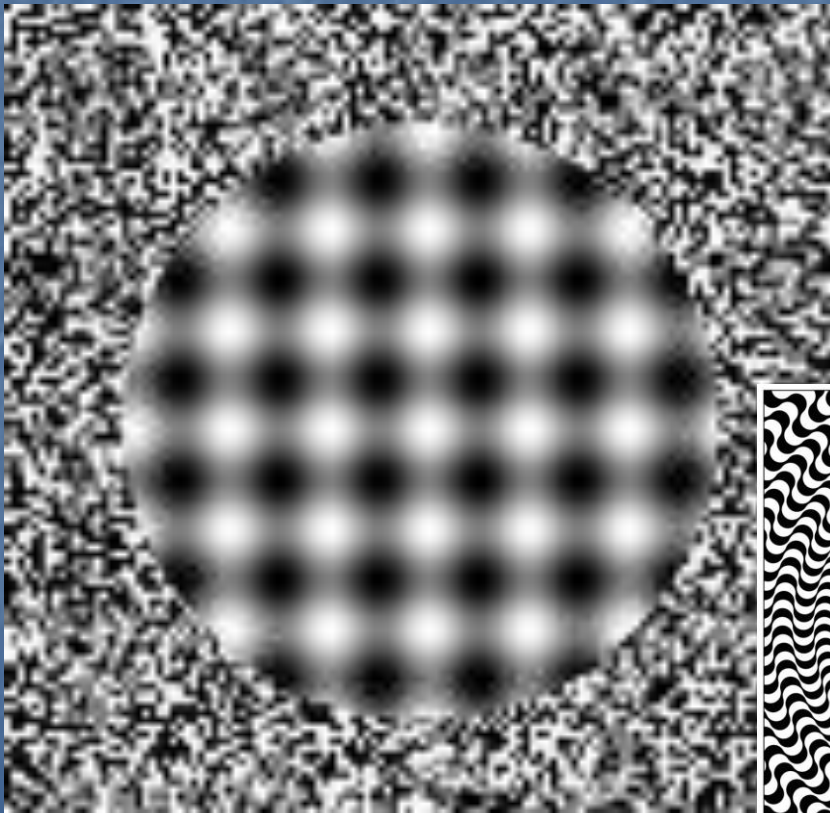
$$\lambda^2 \frac{\partial^2 V}{\partial x^2} - V - \tau \frac{\partial V}{\partial t} = 0$$

$$\lambda = \sqrt{\frac{r_m}{r_l}}$$

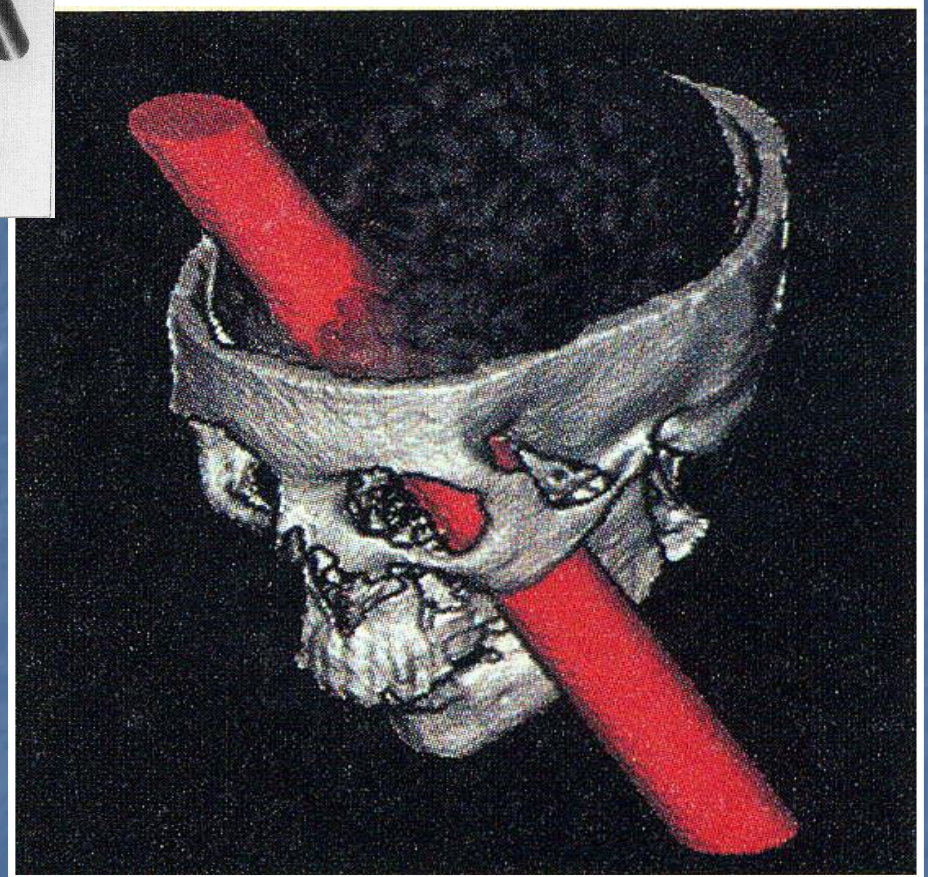
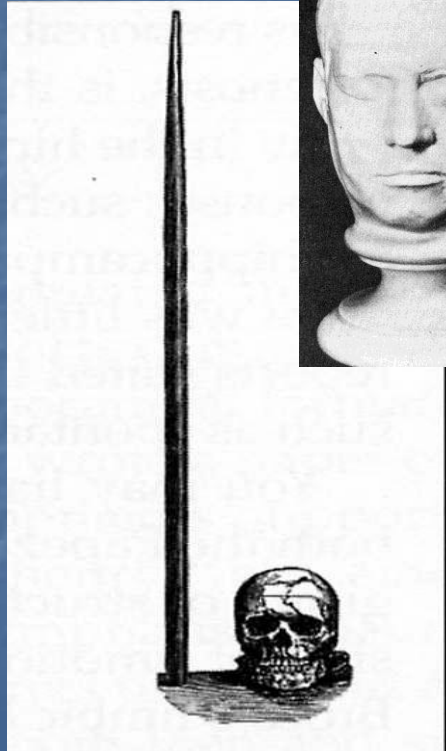
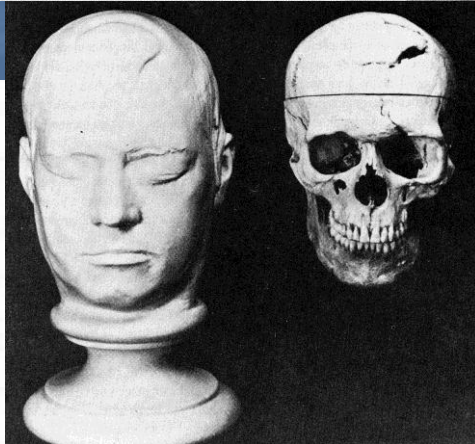
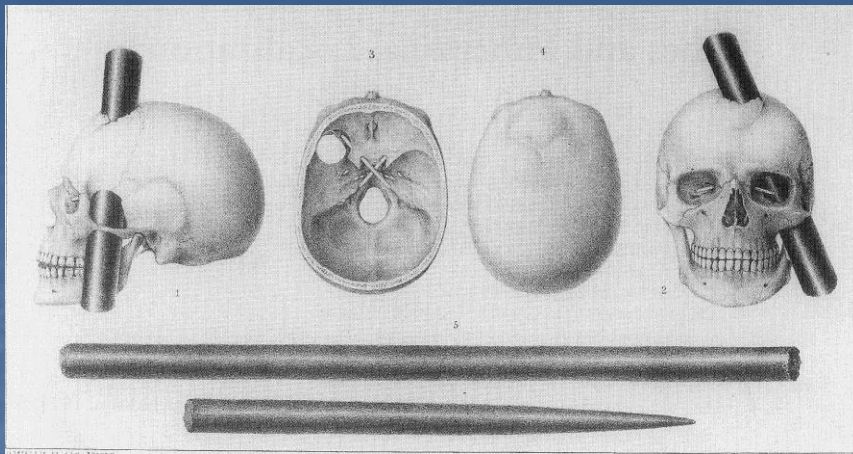
$$\tau = r_m C_m$$



# HERRAMIENTAS PARA UNA METÁFORA FOTÓNICA





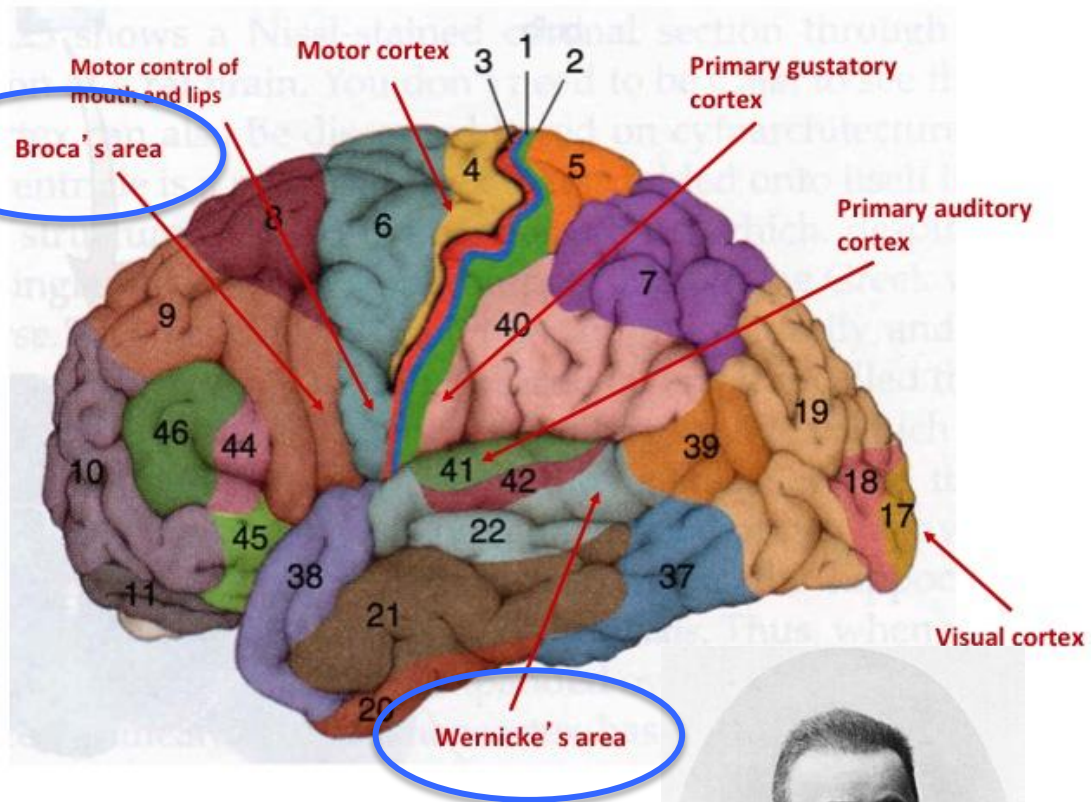


Caso de Phineas P. Gage  
(1848)





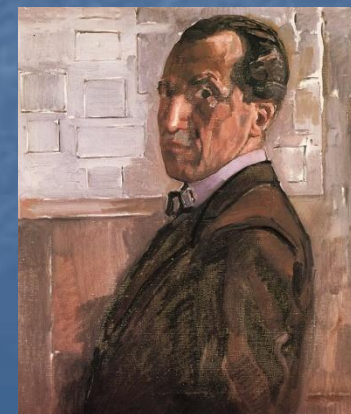
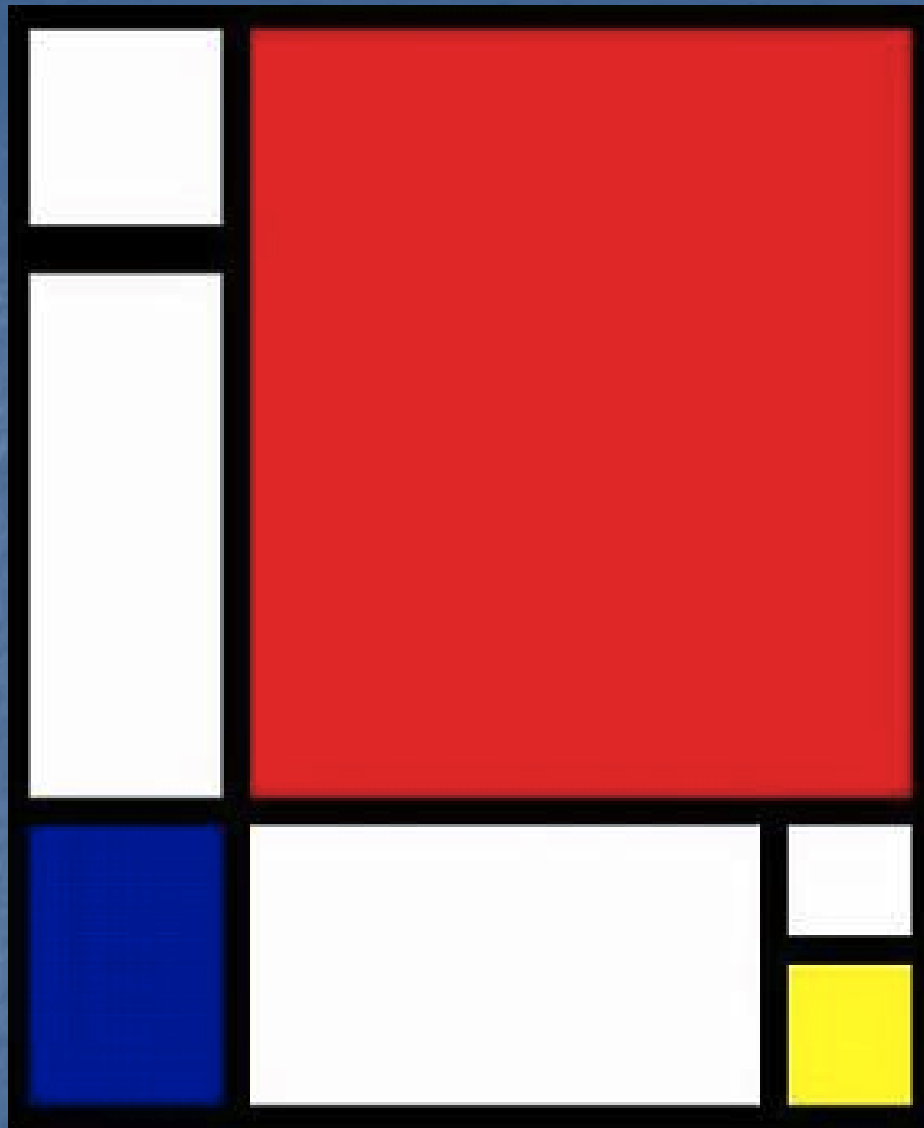
Paul Broca  
(1824-1880)



Paul Wernicke  
(1848-1905)

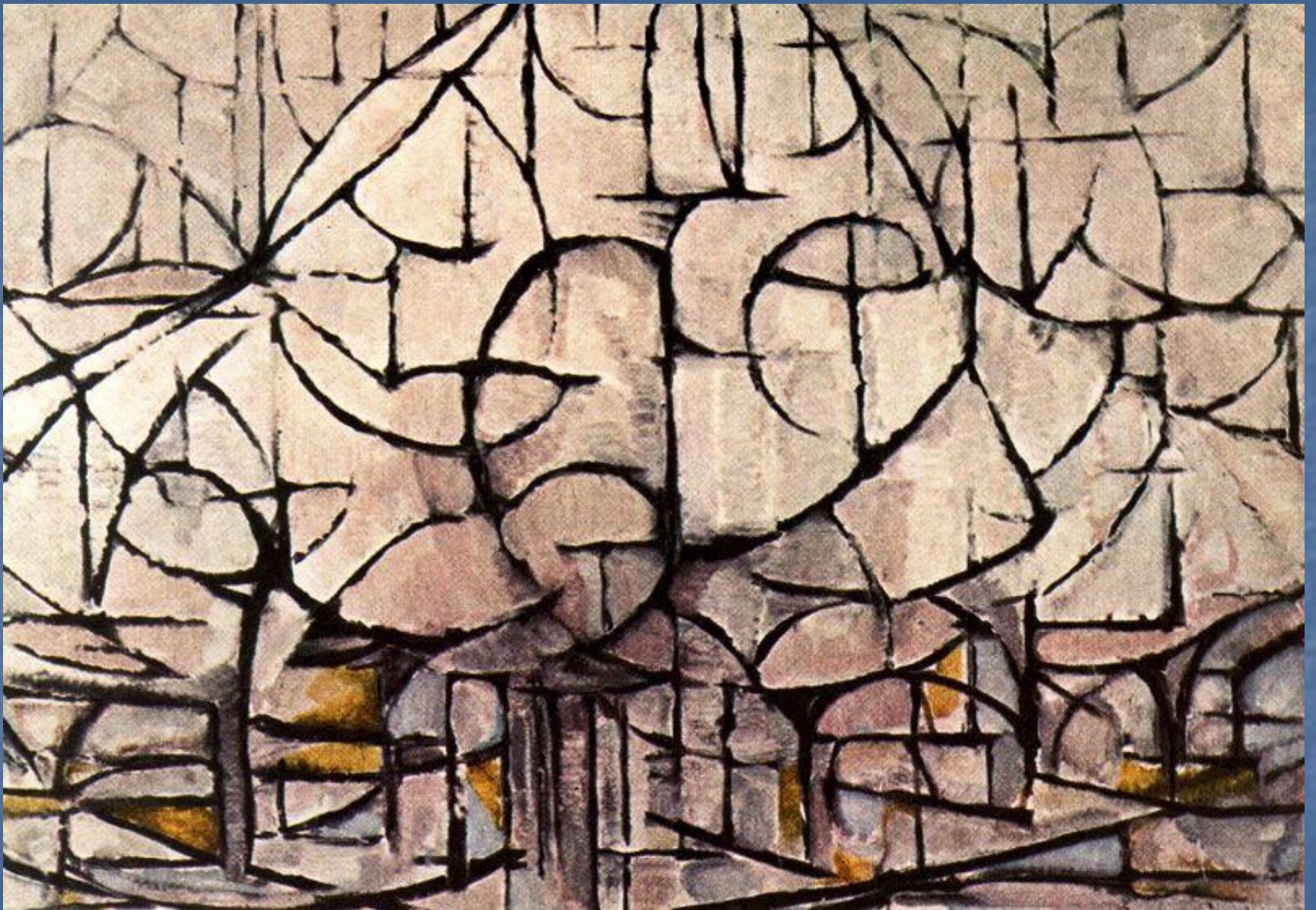
# A MODO DE PROEMIO





Piet Mondrian  
(1872-1944)









*"Árbol rojo", 1908*





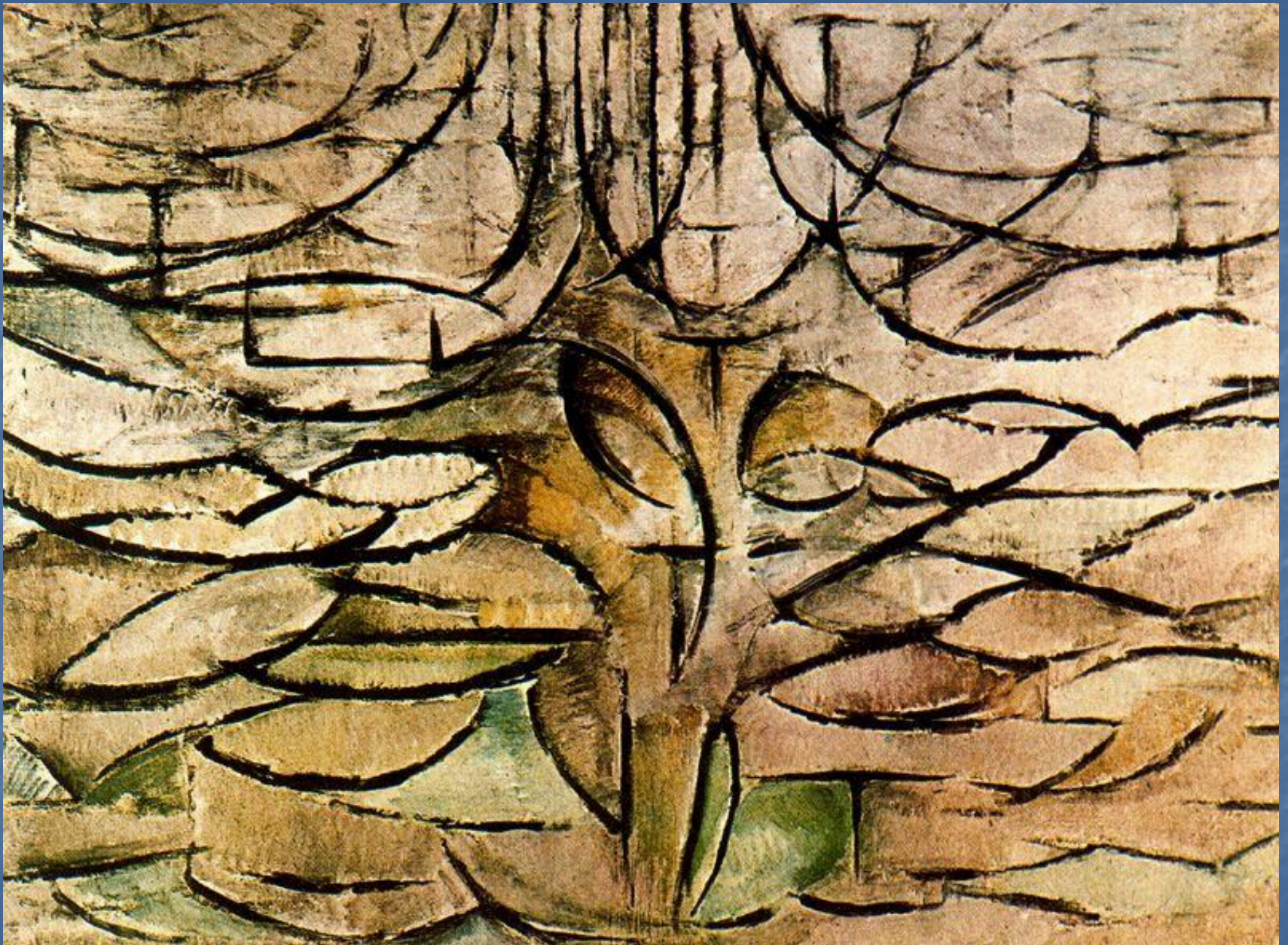
"Árbol azul", 1909





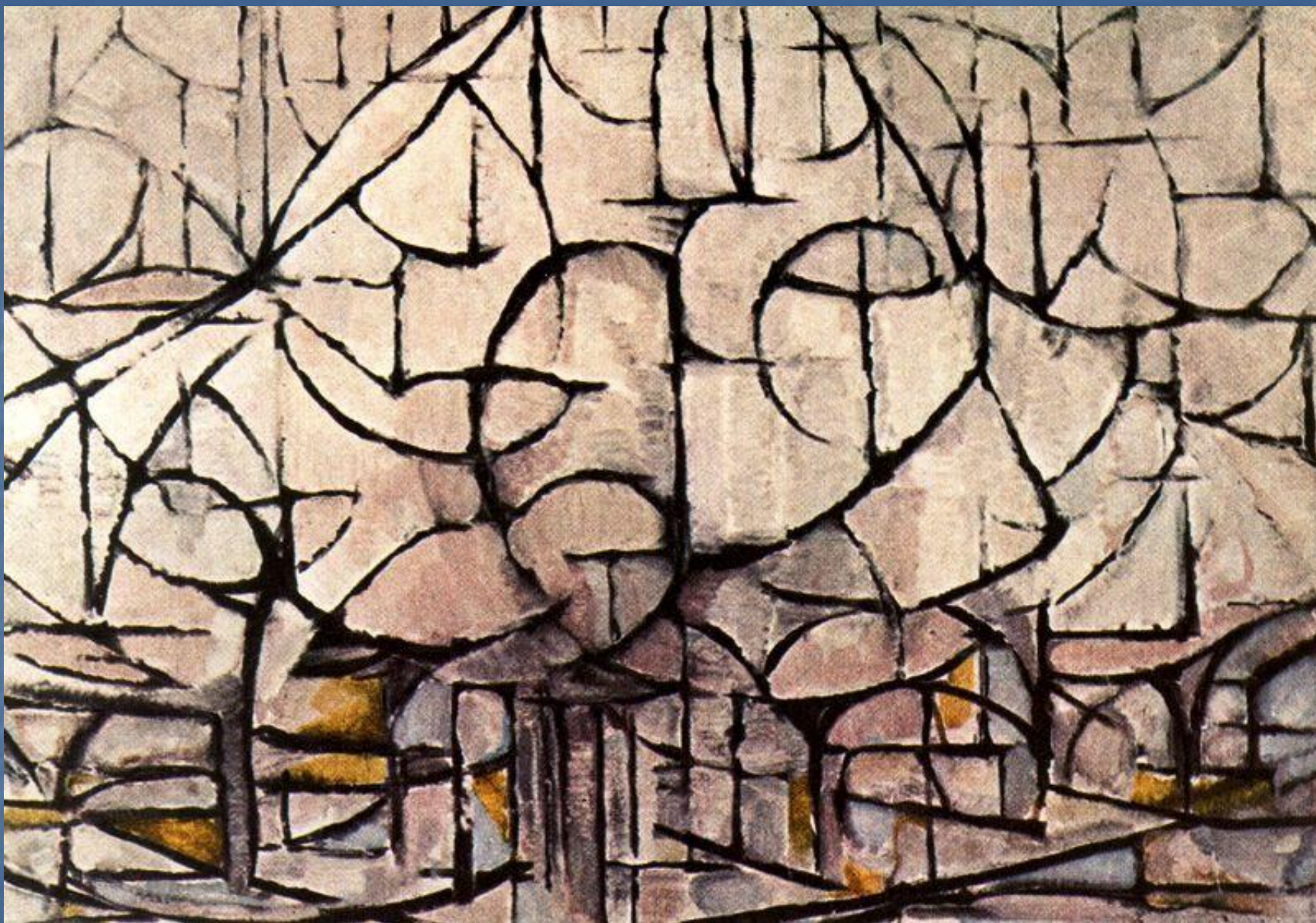
*"Albero argentato", 1911*





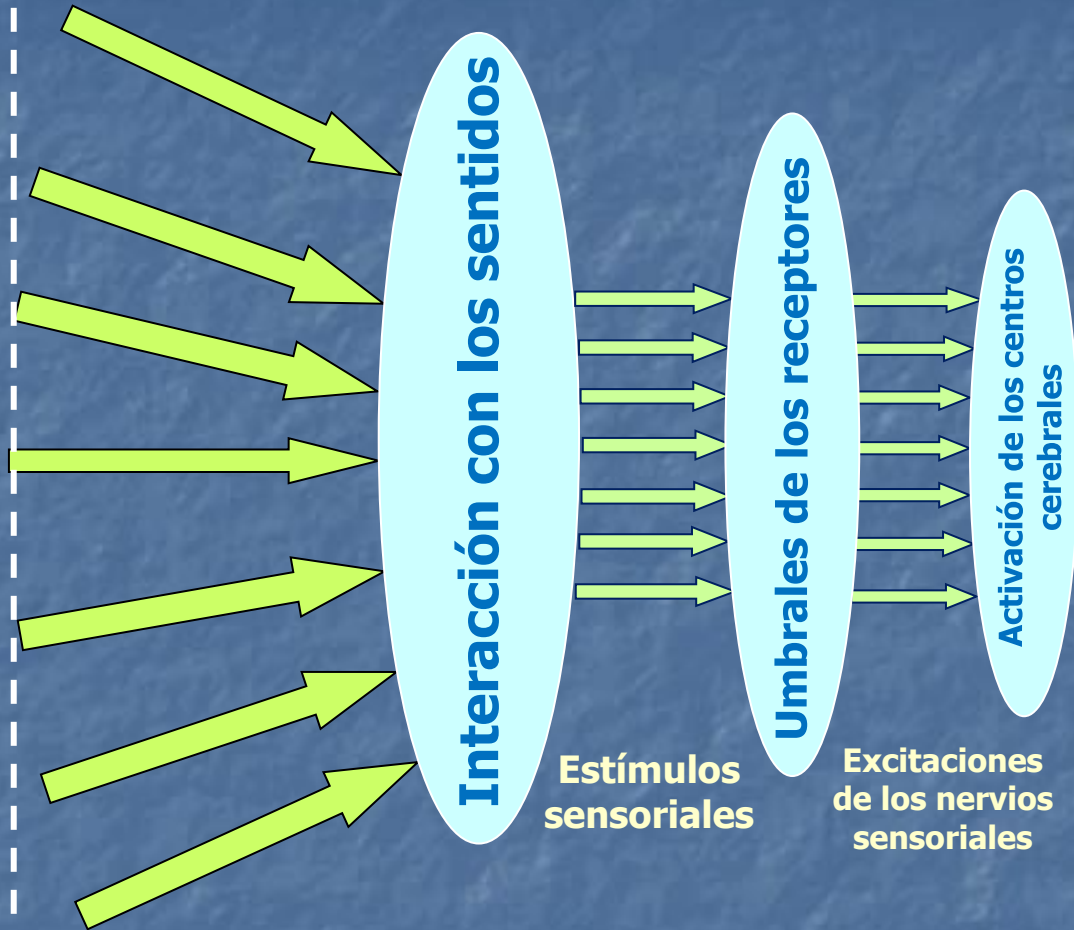
*"Melo in Fiore", 1912*





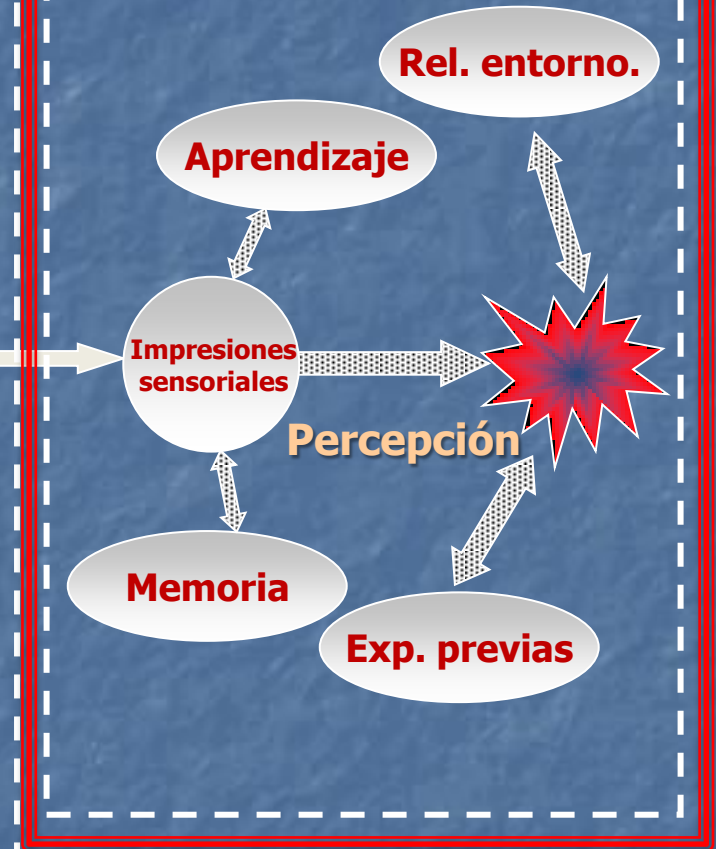
*"Árboles en flor", 1912*

## *Sensaciones objetivas*

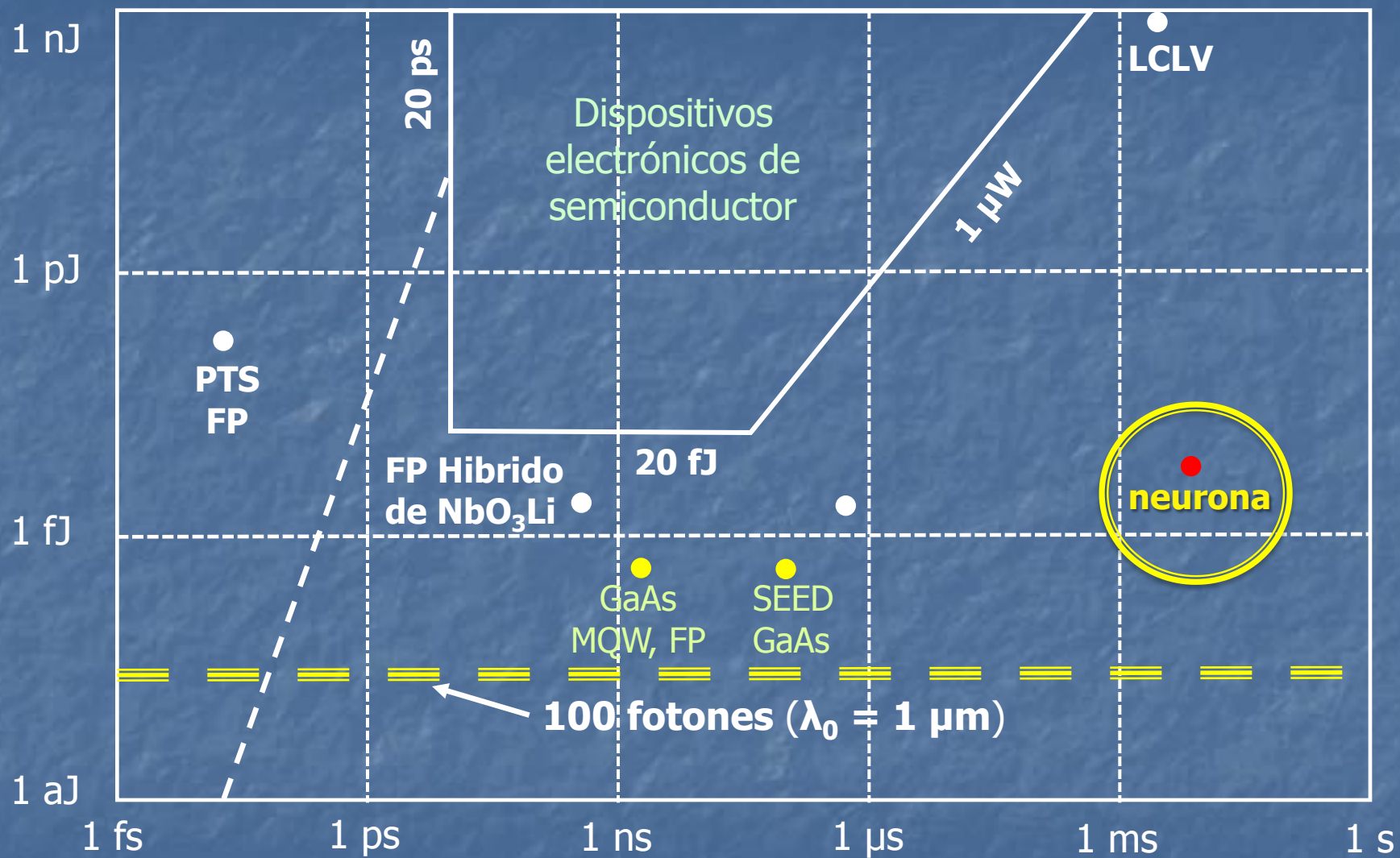


**Fenómenos externos**

## *Sensaciones subjetivas*

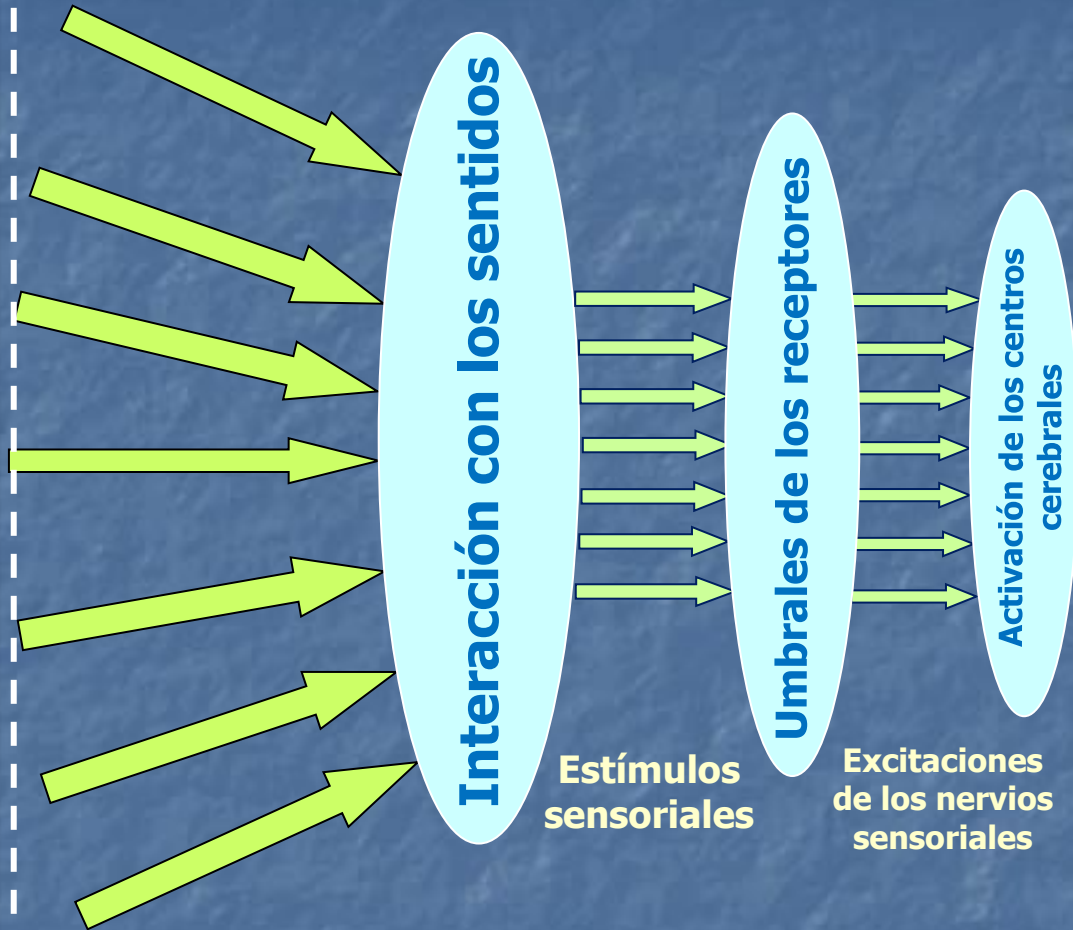






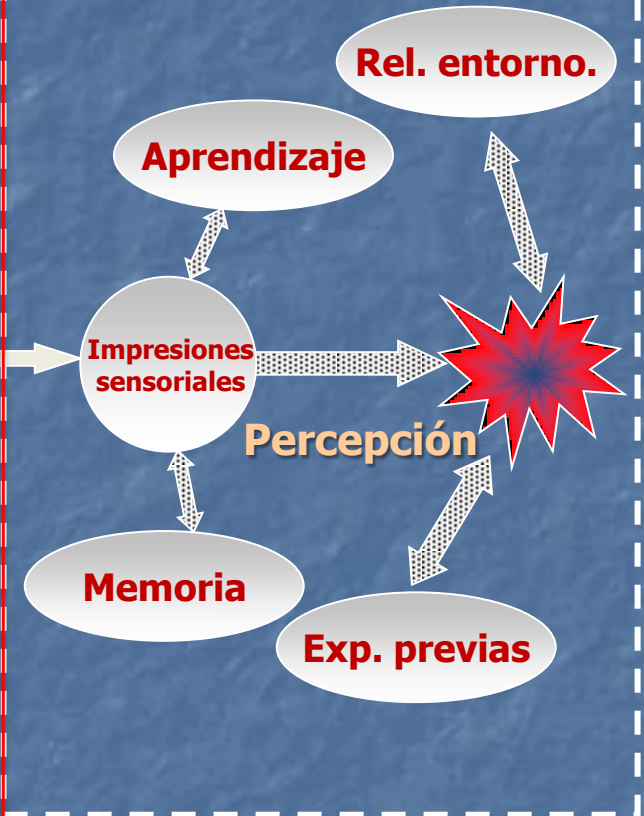
Basado en P.W. Smith. Bell Syst. Tech. Jour. 1982

## *Sensaciones objetivas*

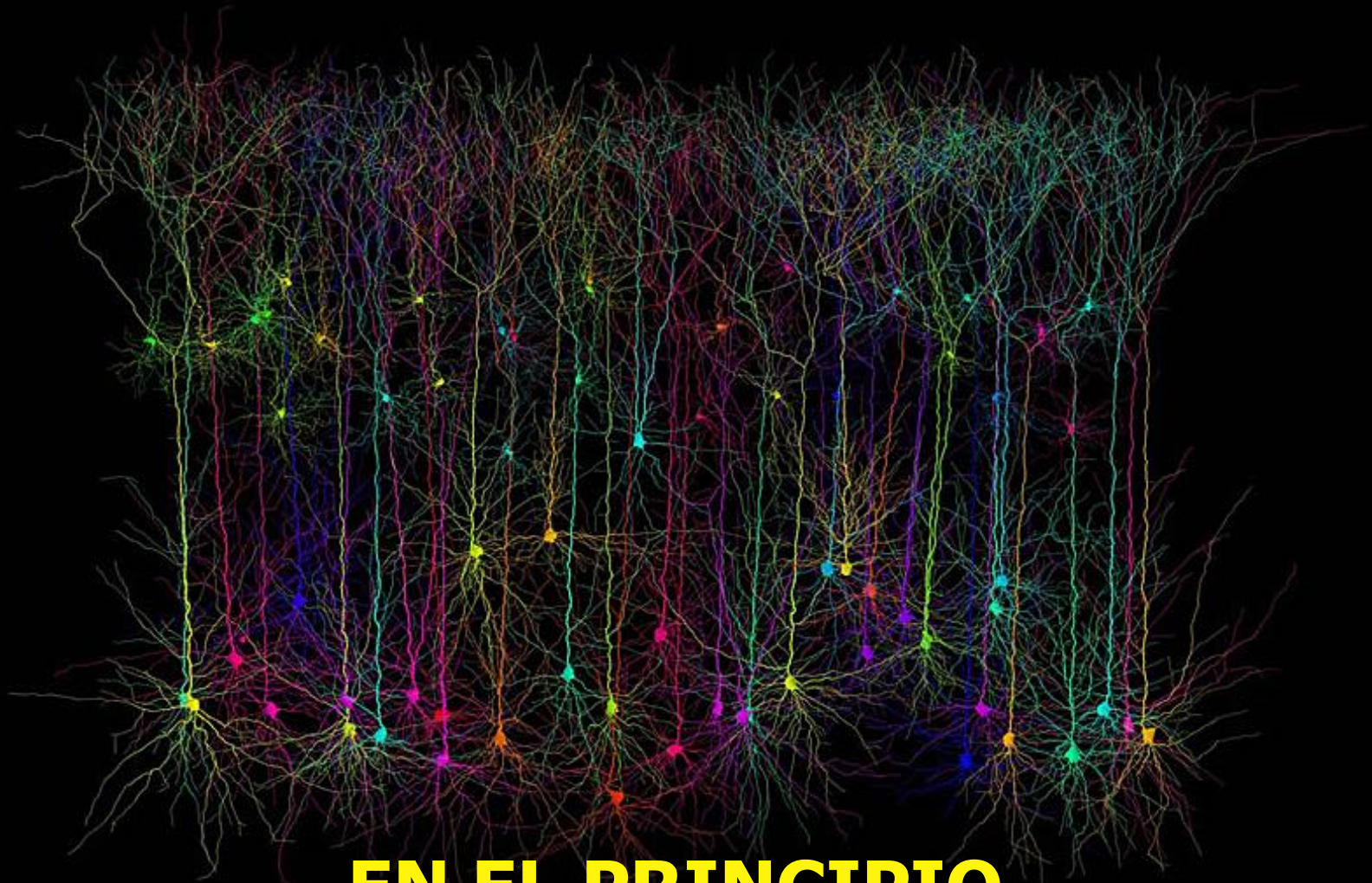


**Fenómenos externos**

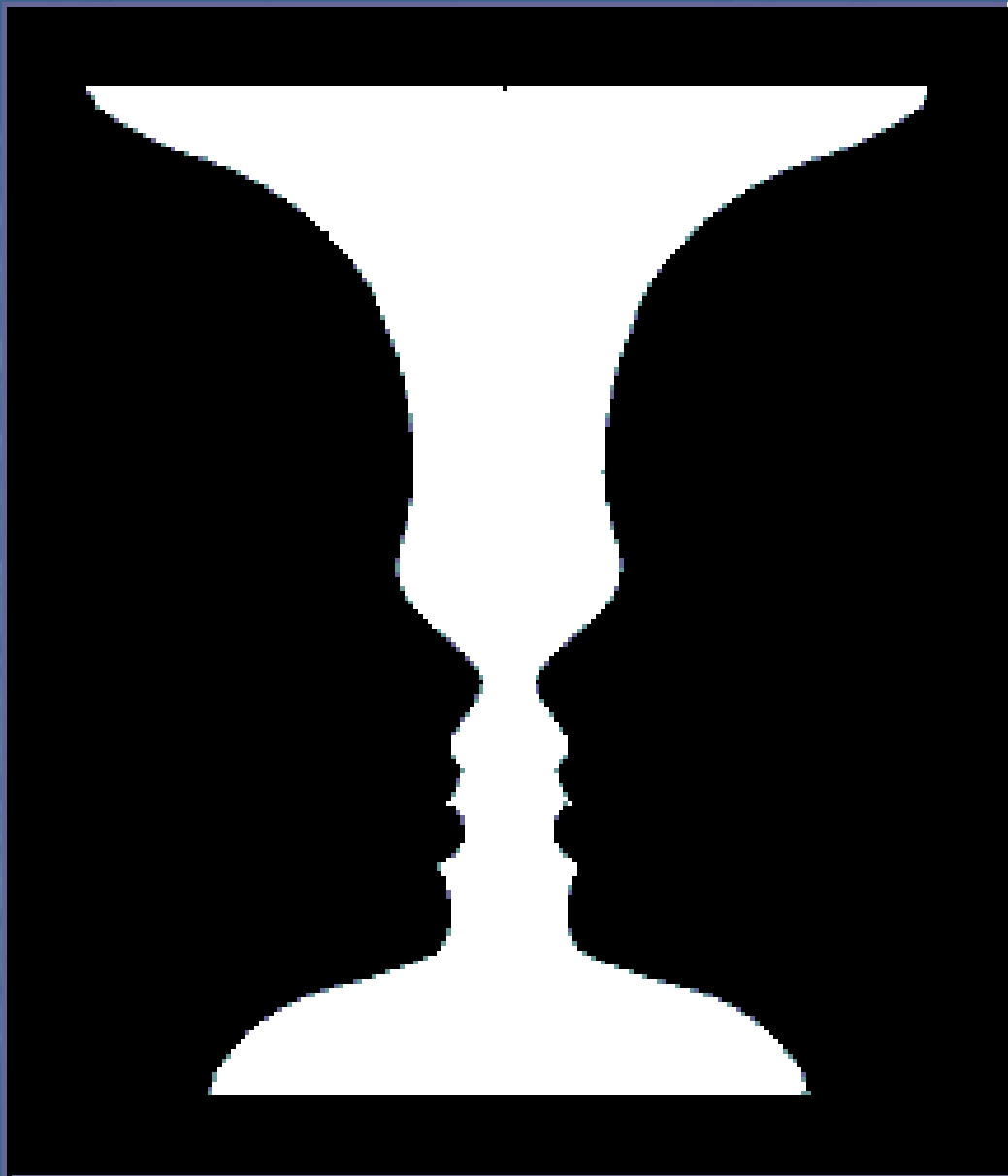
## *Sensaciones subjetivas*







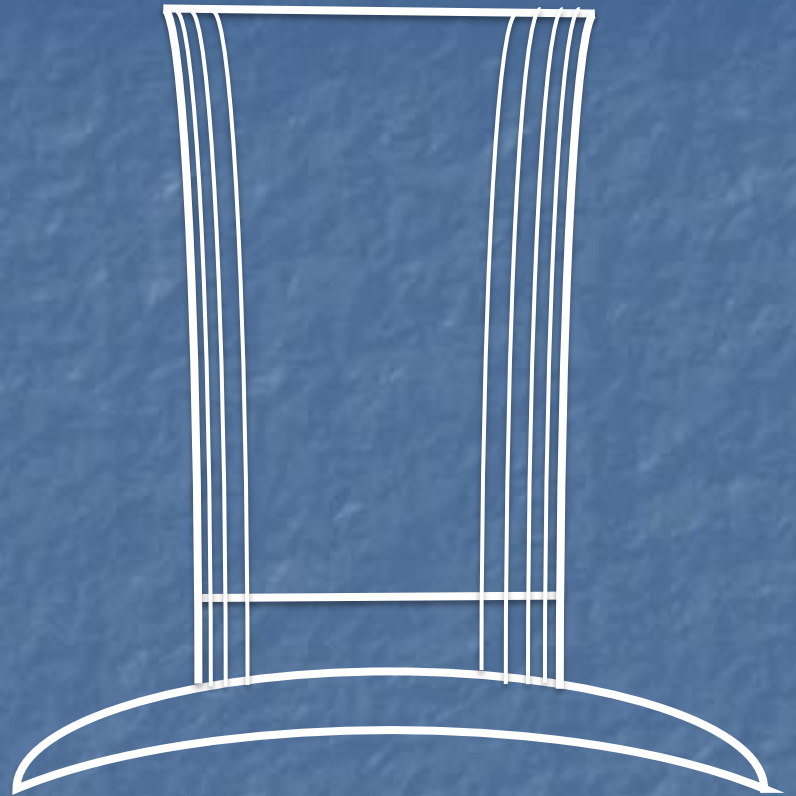
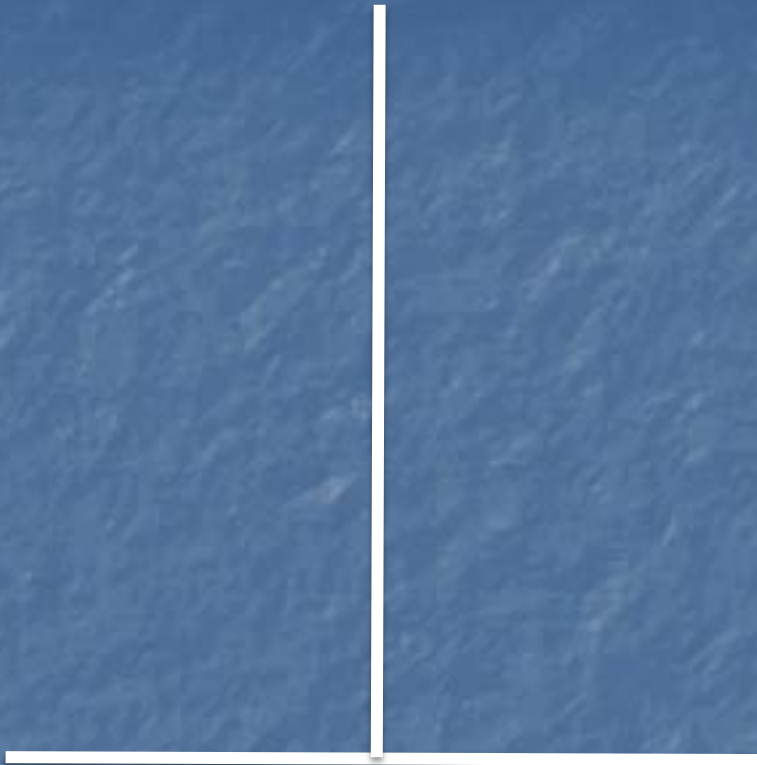
**EN EL PRINCIPIO**



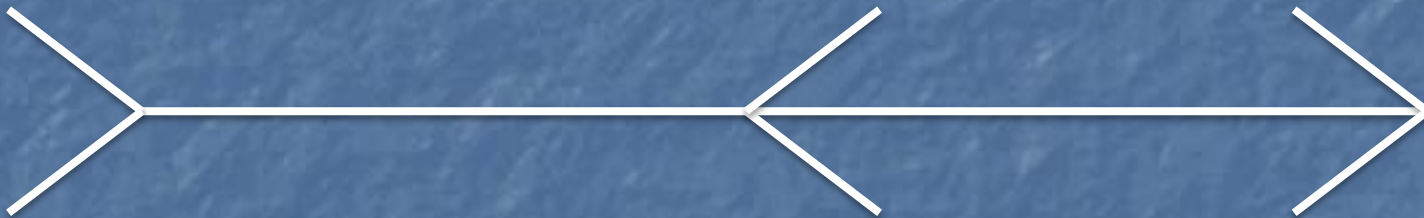




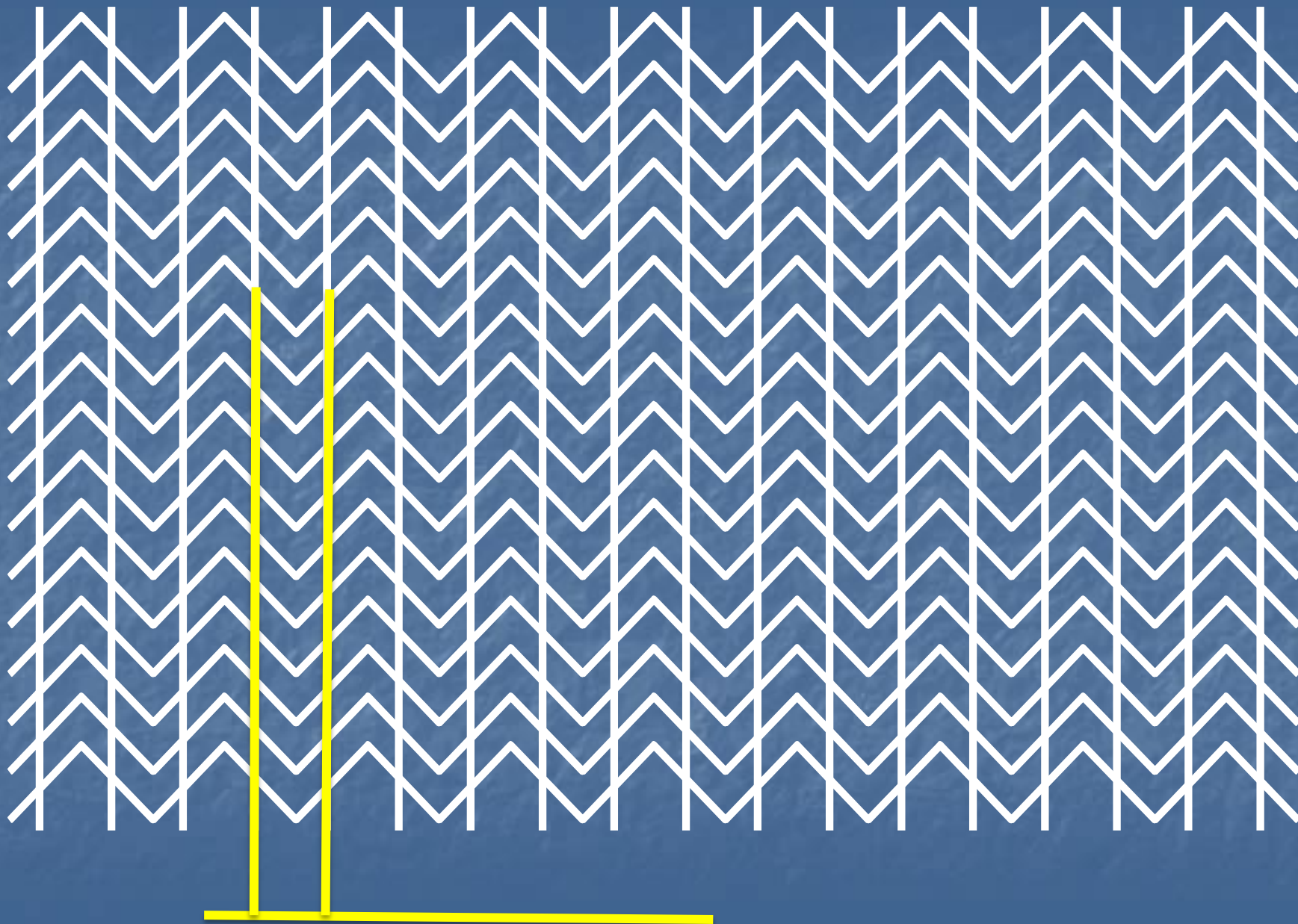
Giuseppe Arcimboldo (1527-1593)



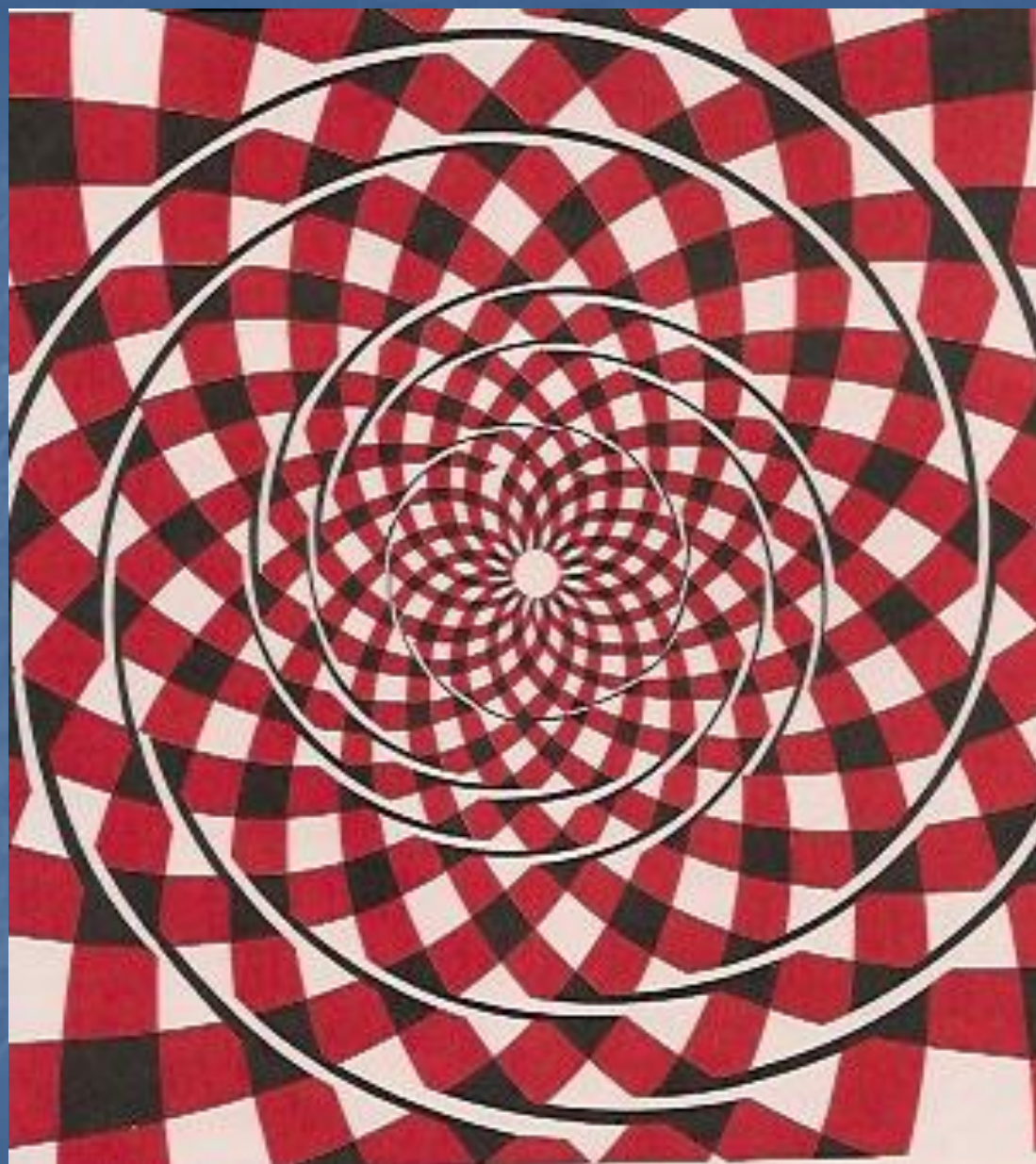




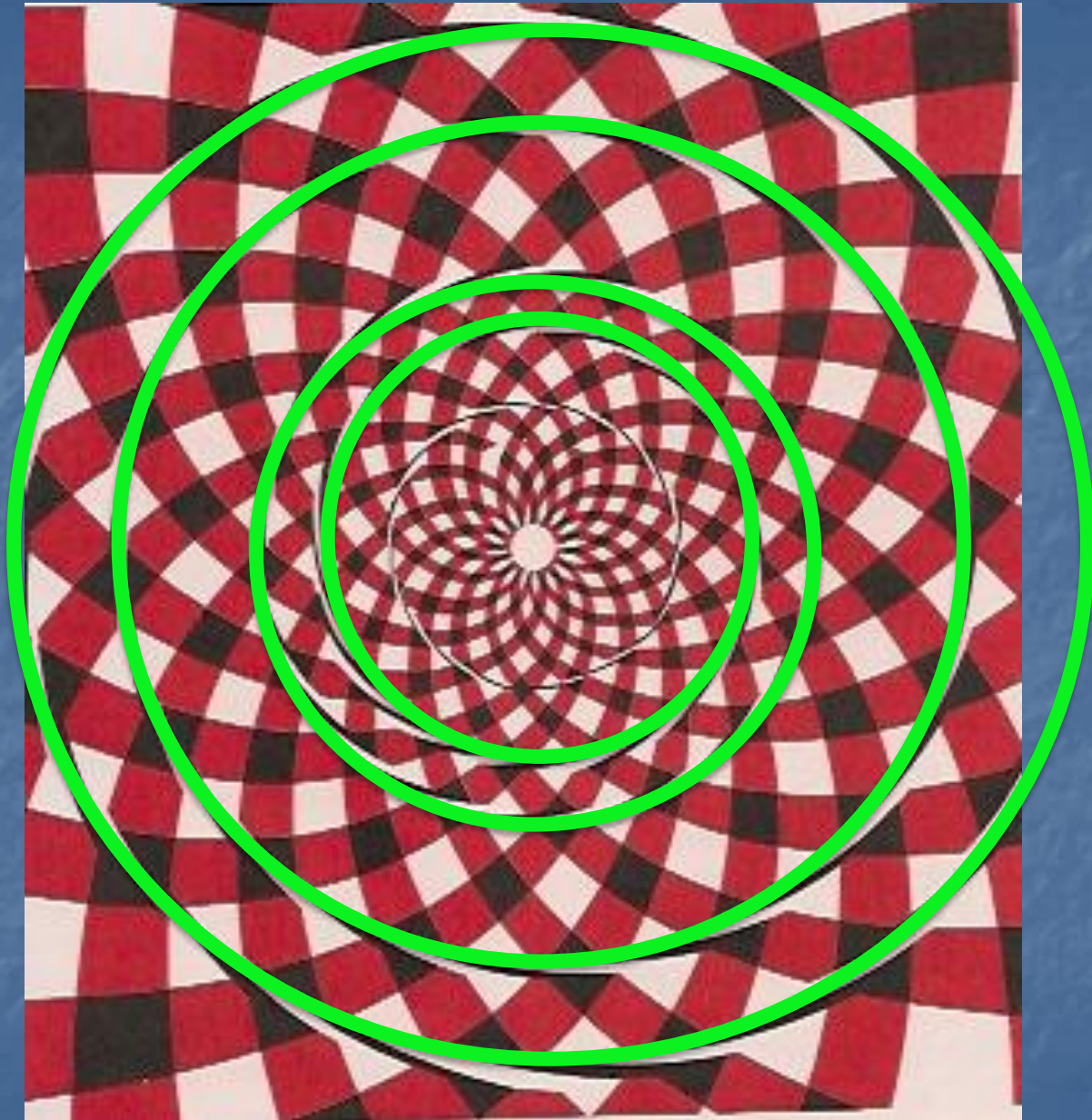




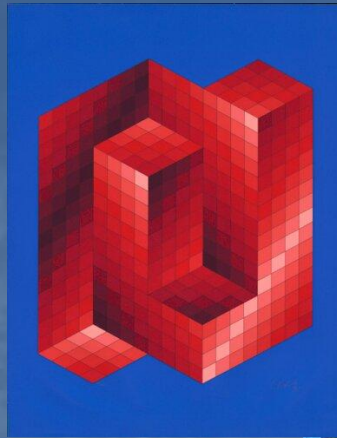










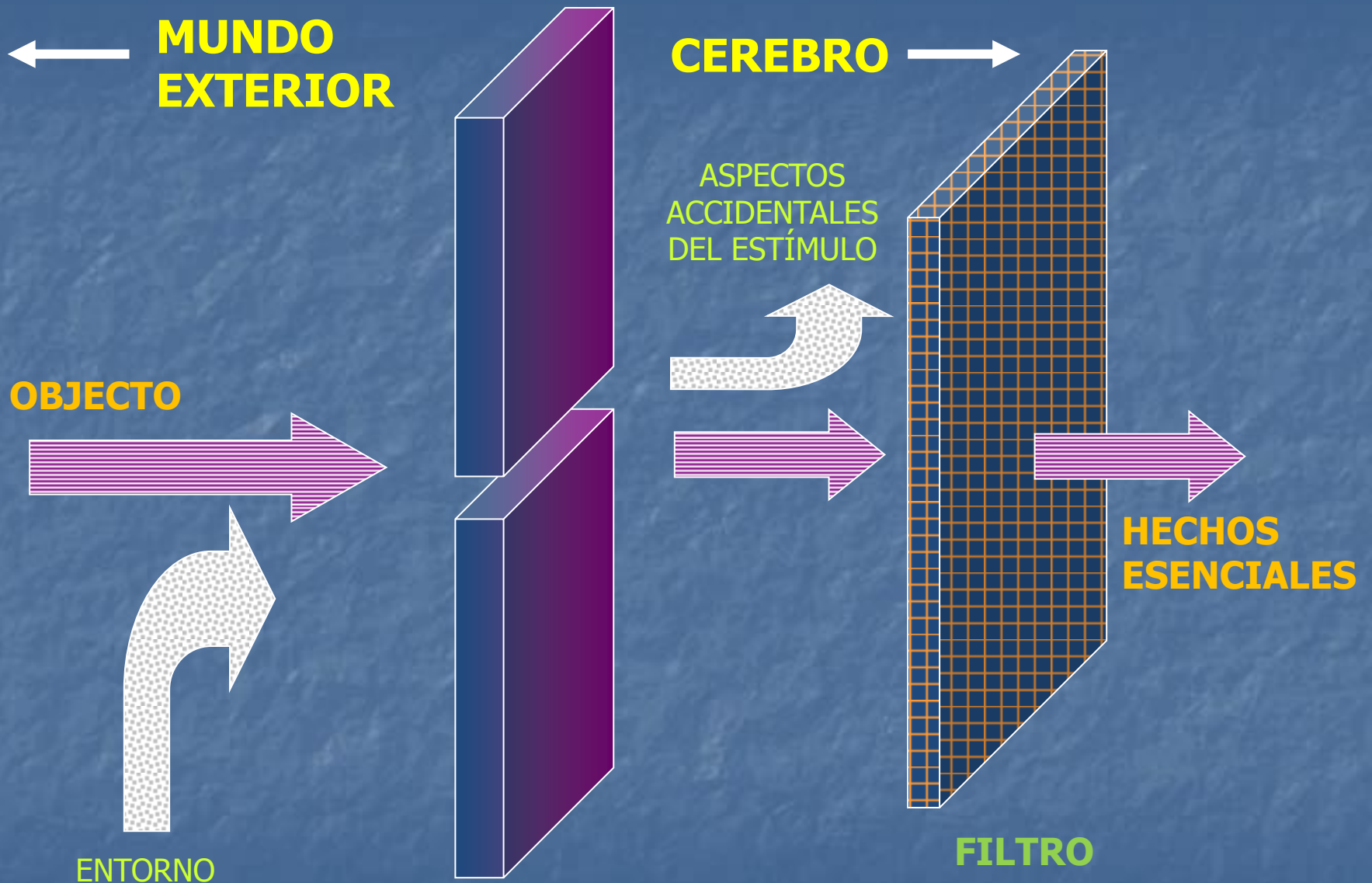


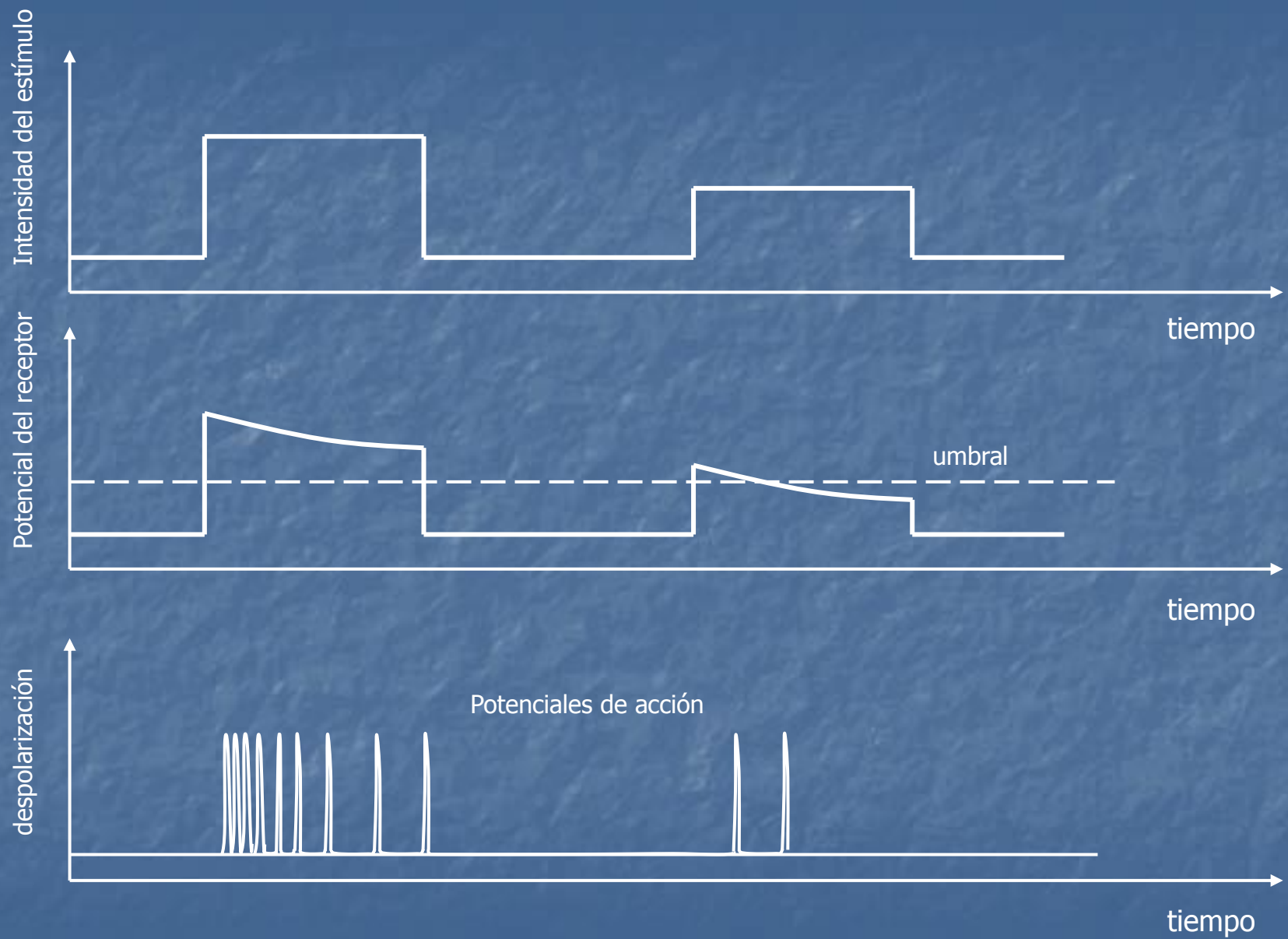
Vasarely



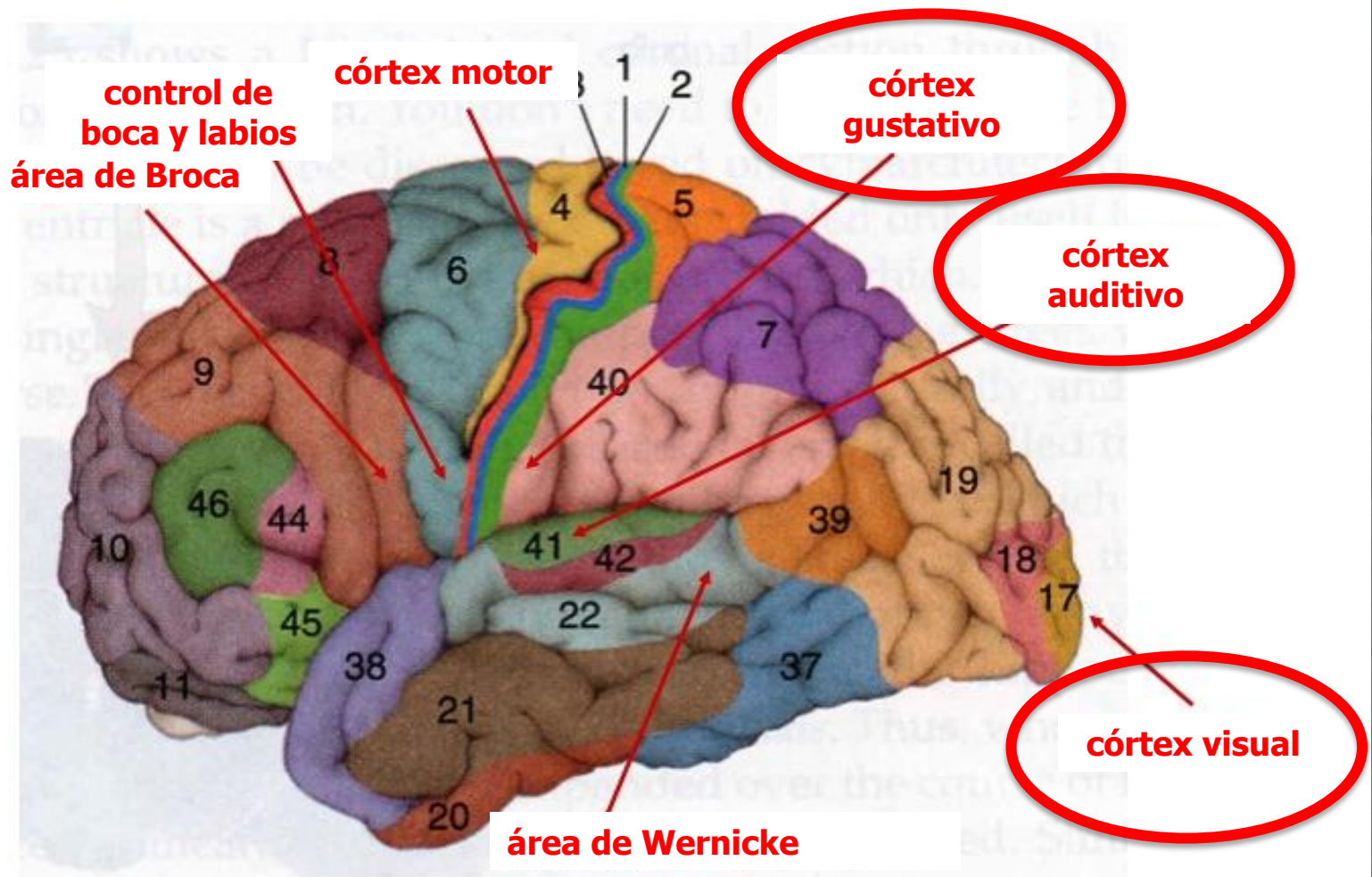
# FORMAS

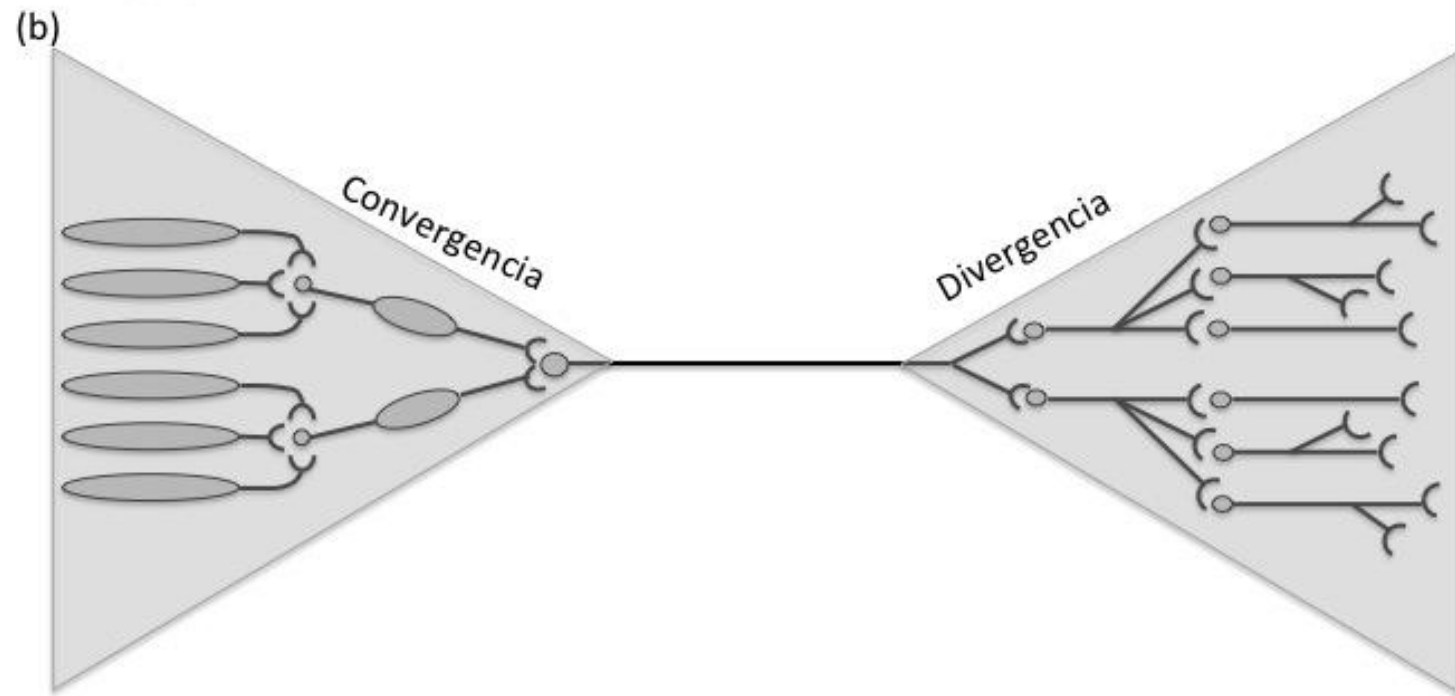
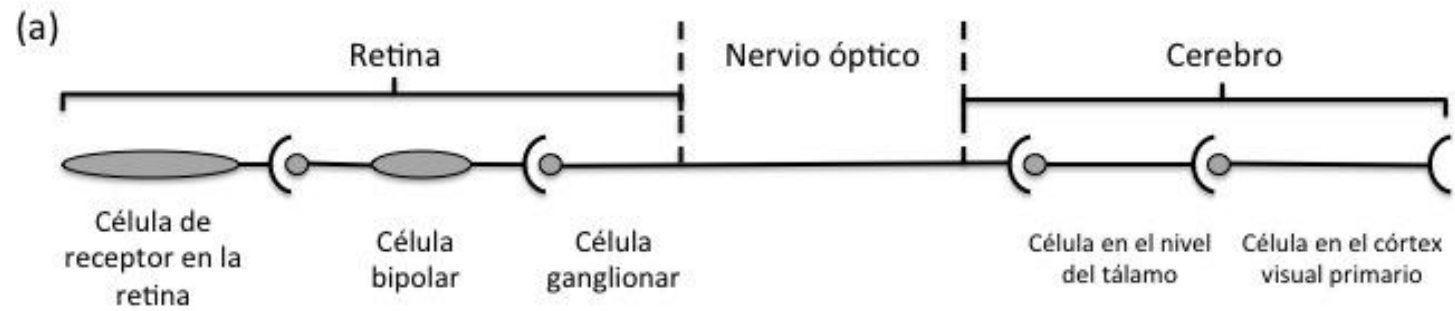




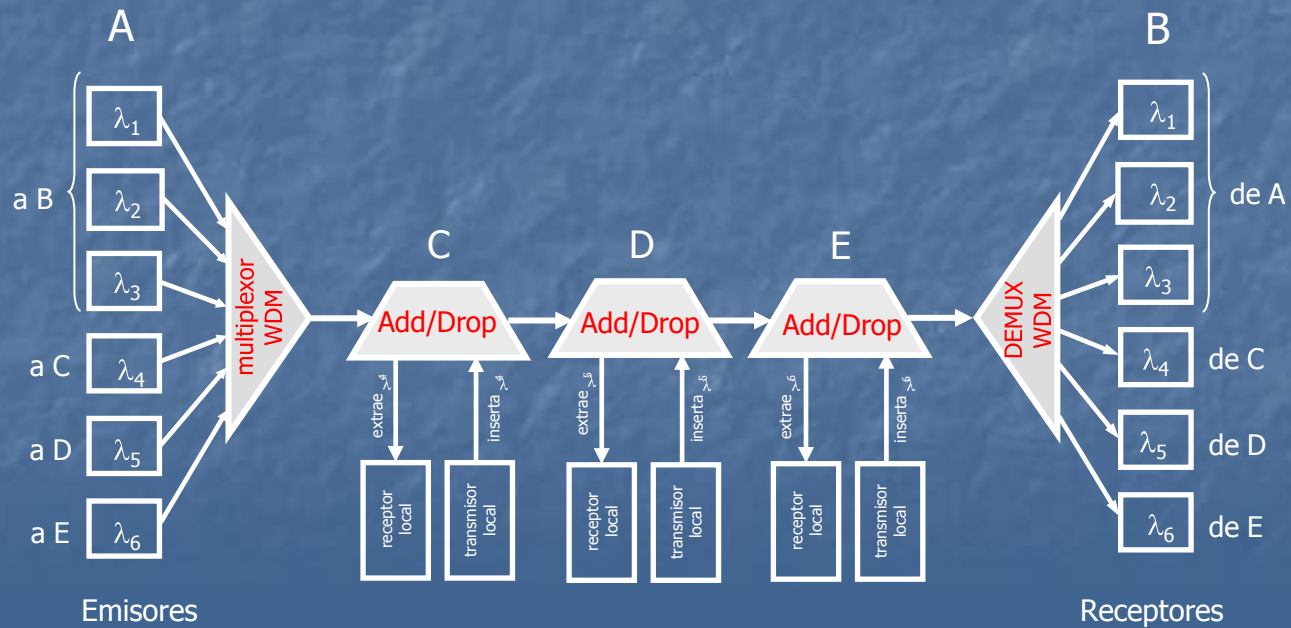
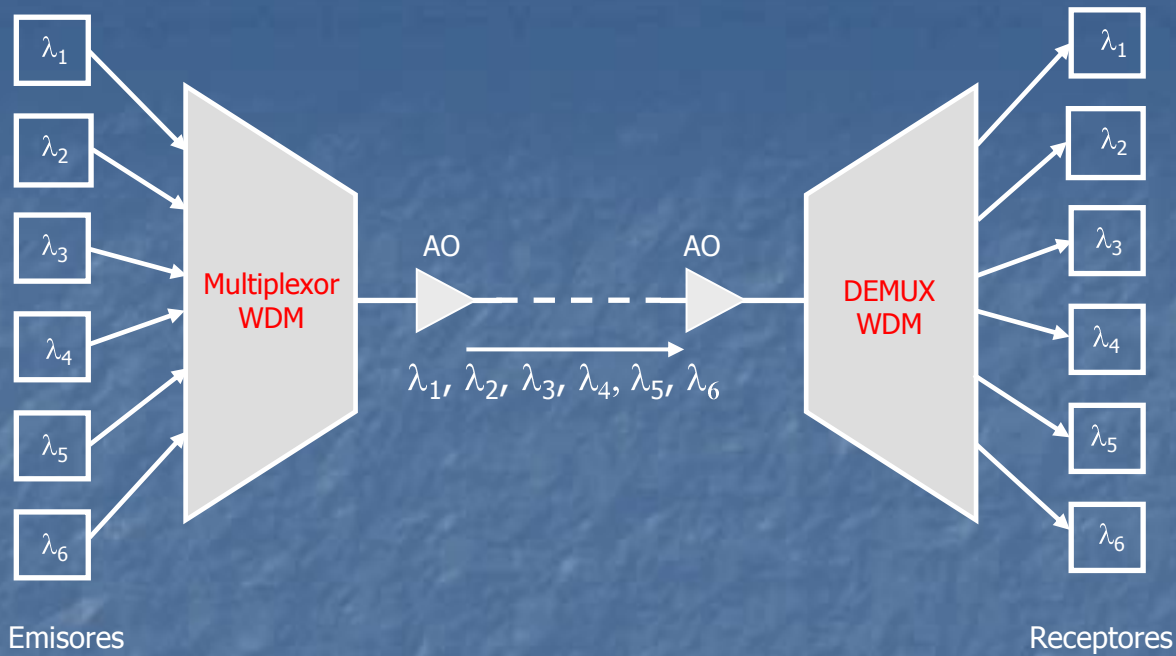






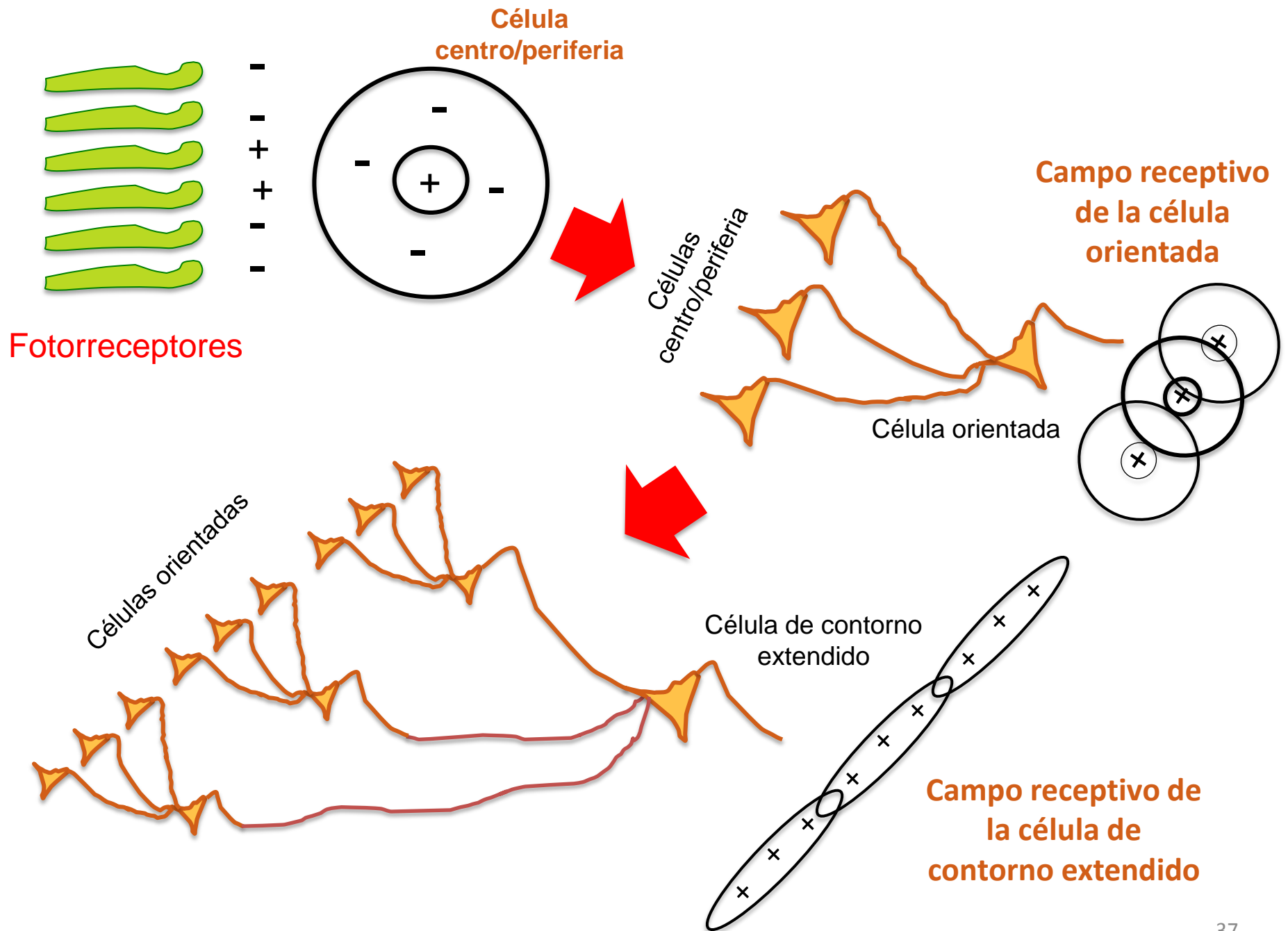






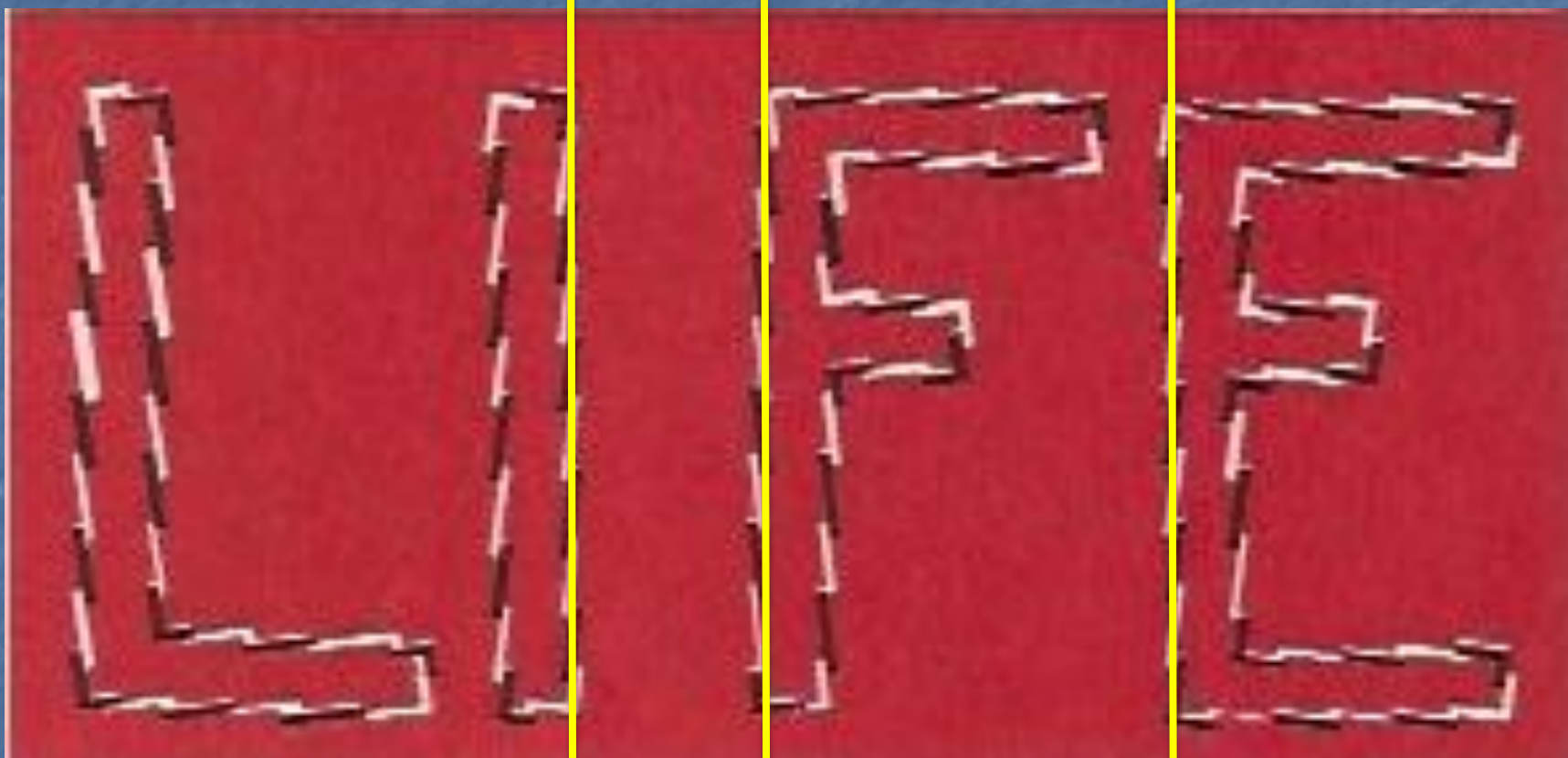


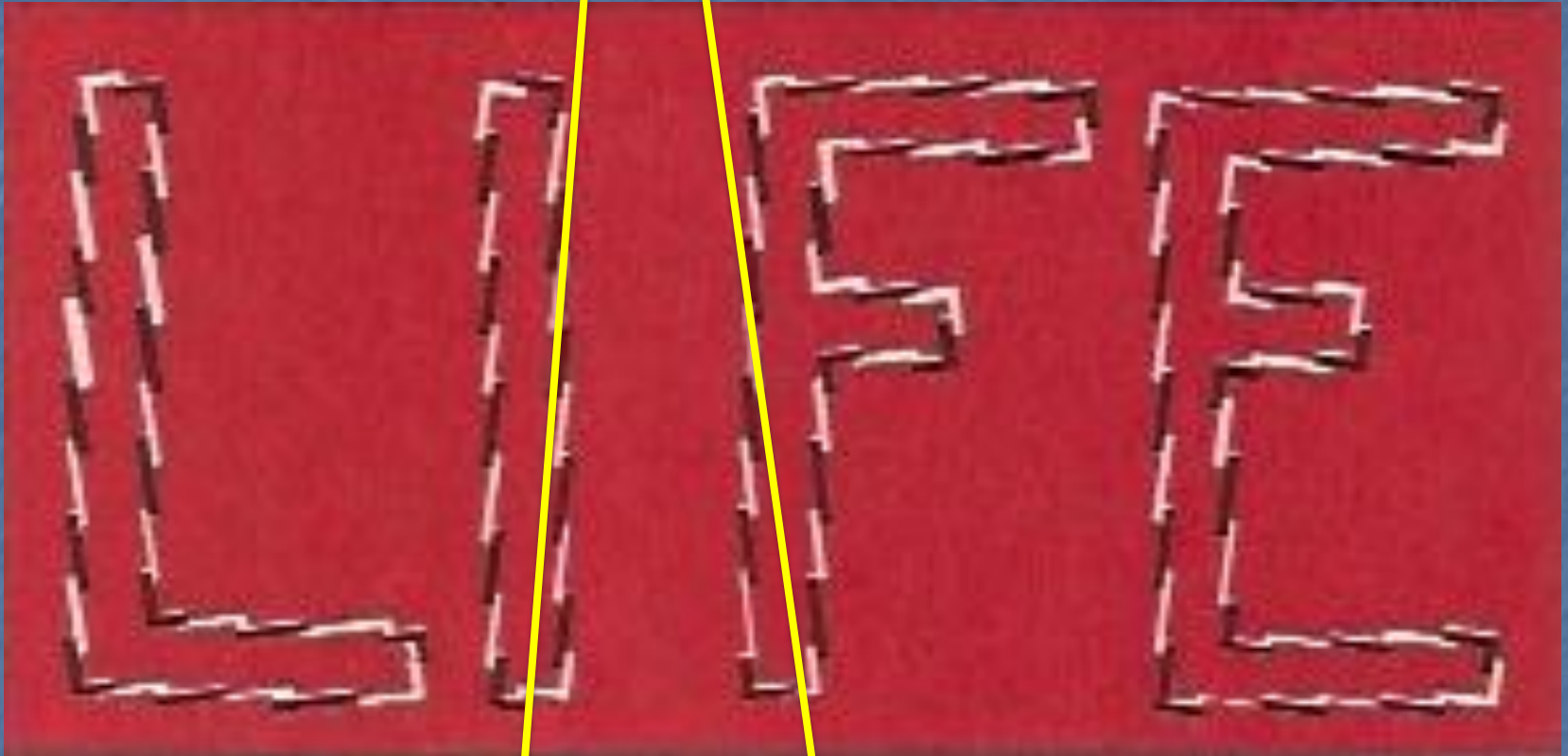




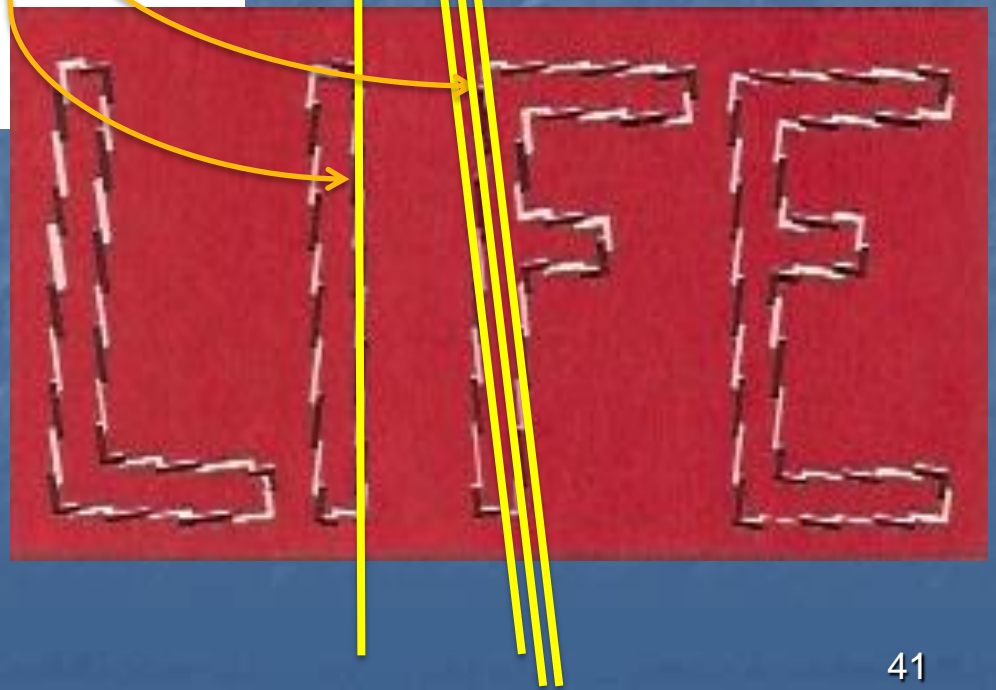
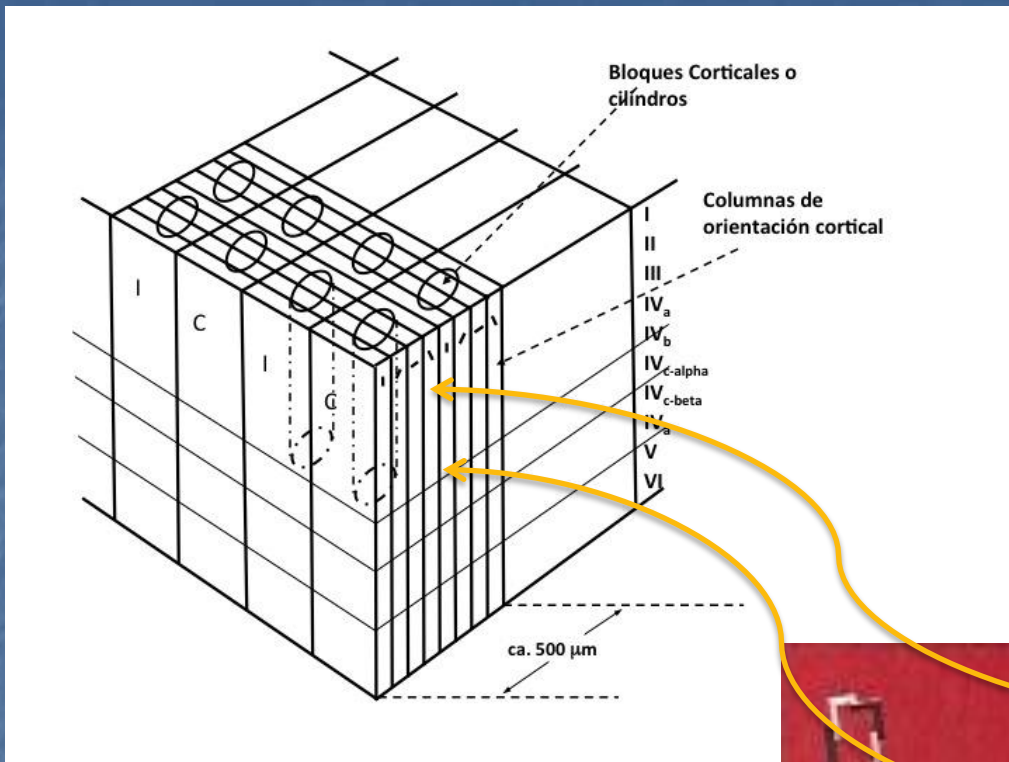












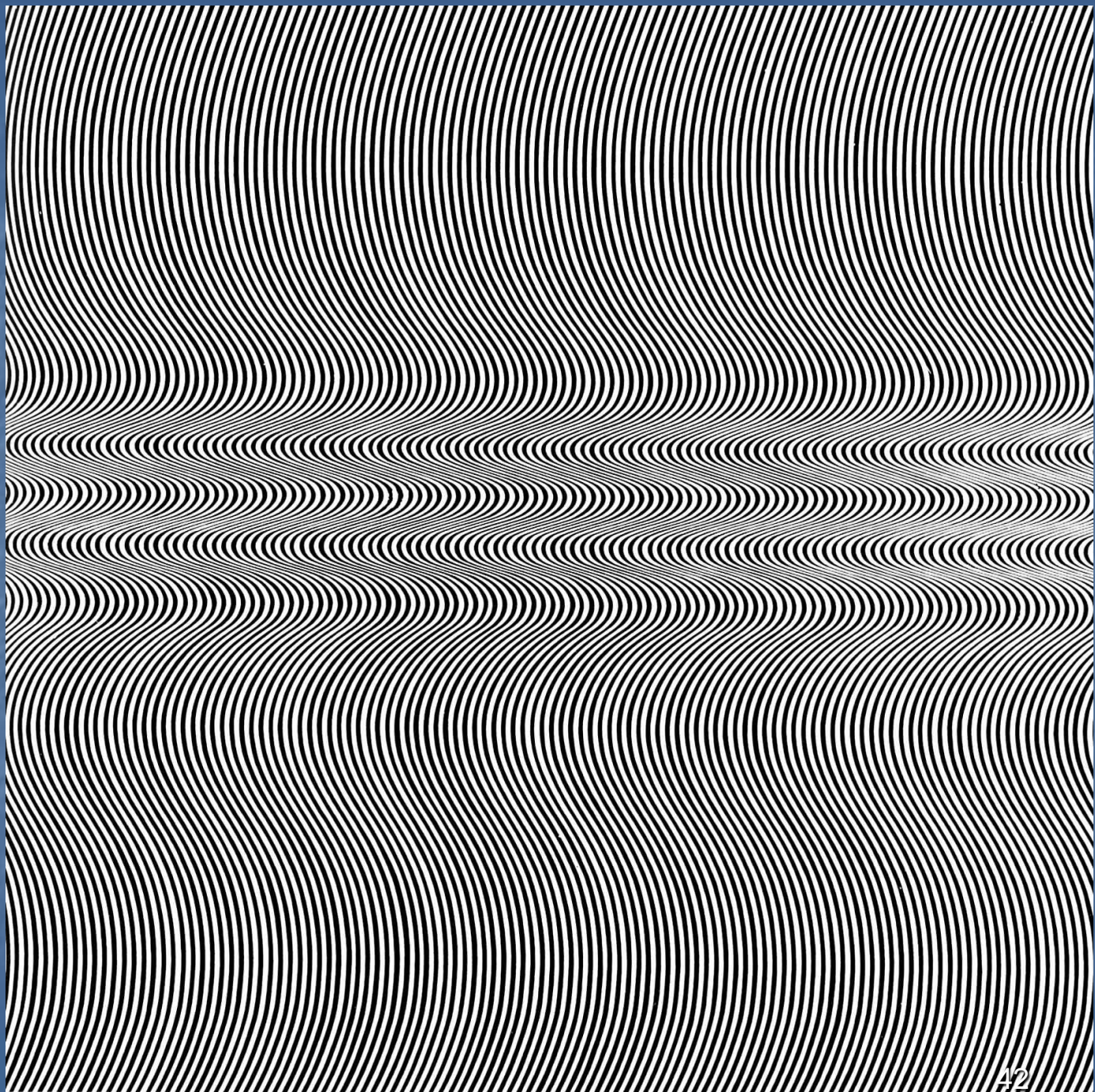




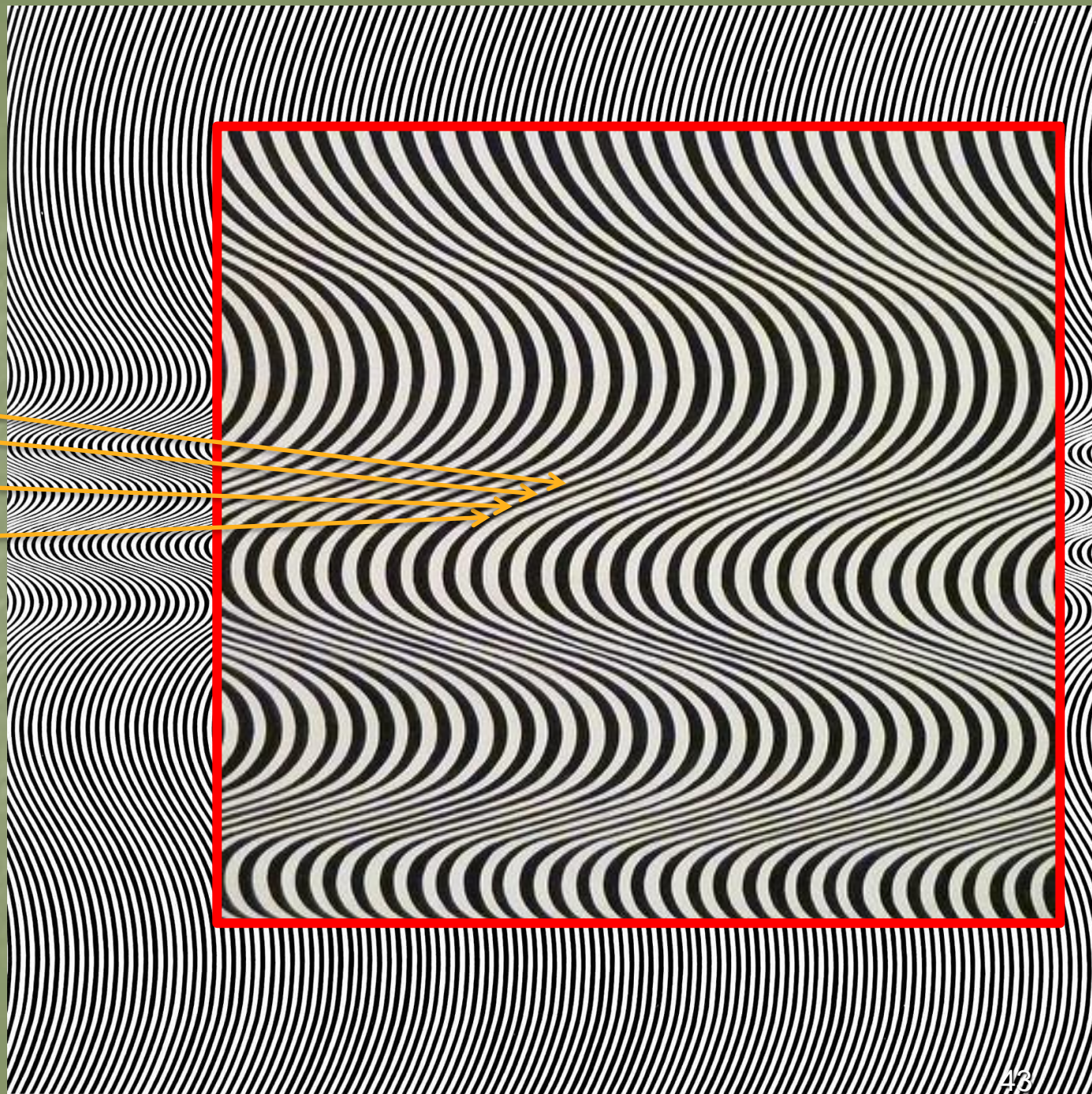
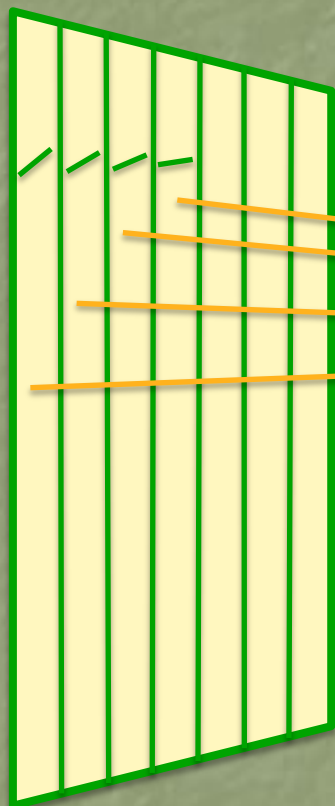
Bridget L. Riley  
(1931)



*Fall.* 1963

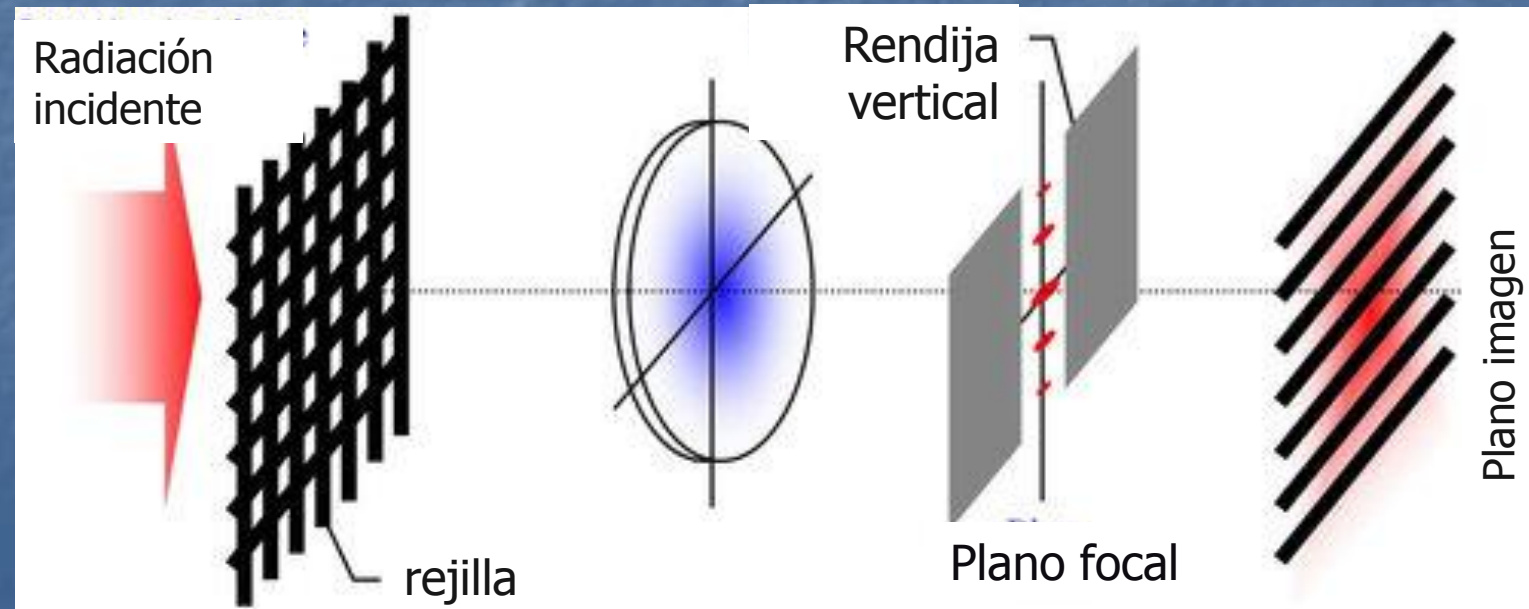
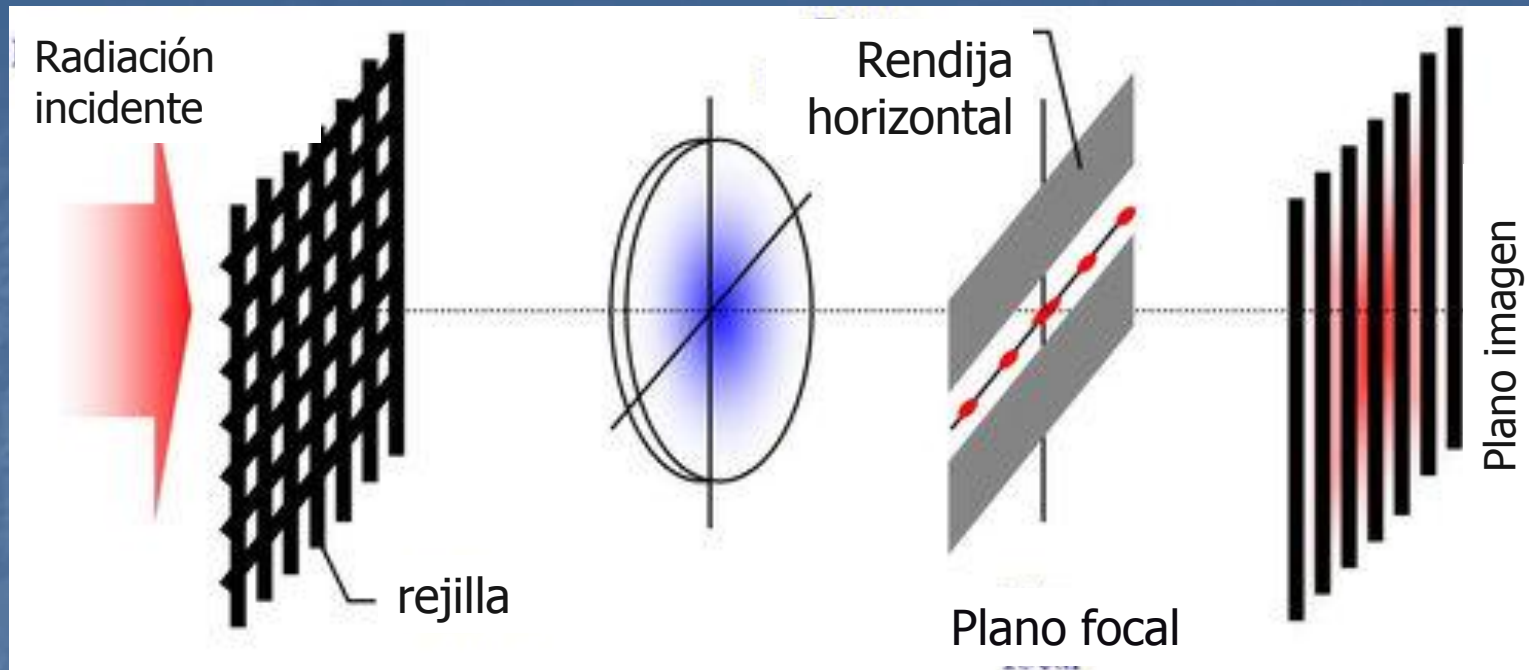








## Experimentos de Abbe (1893) y Porter (1906)



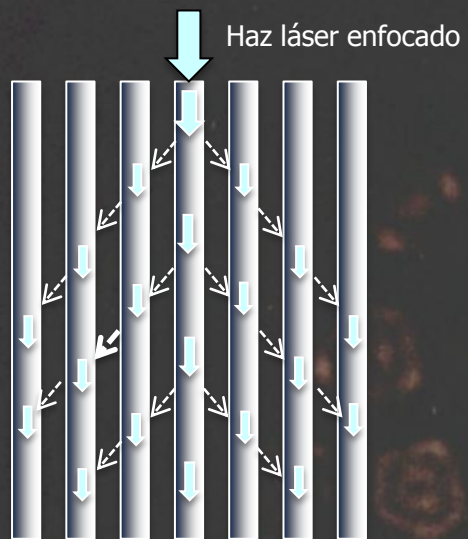




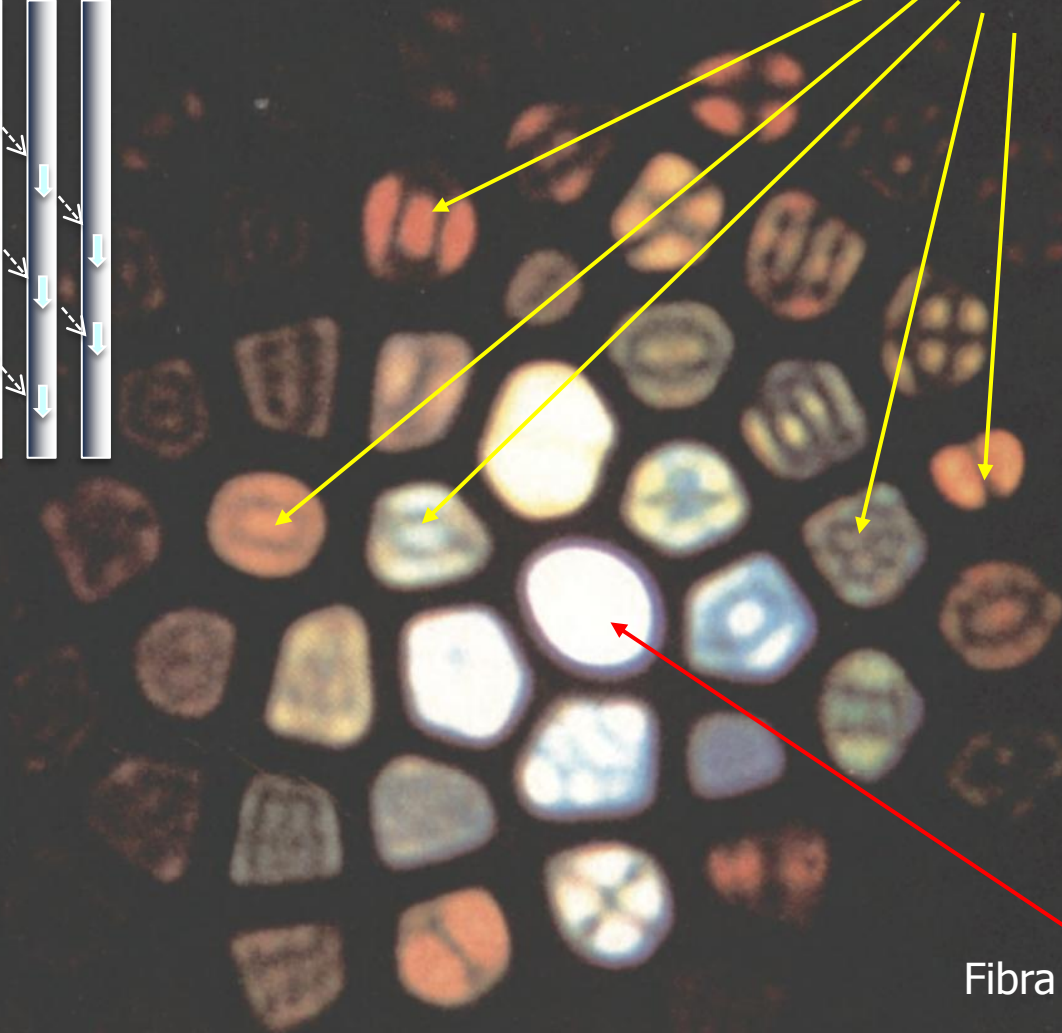
Yayoi Kusama  
(1929)





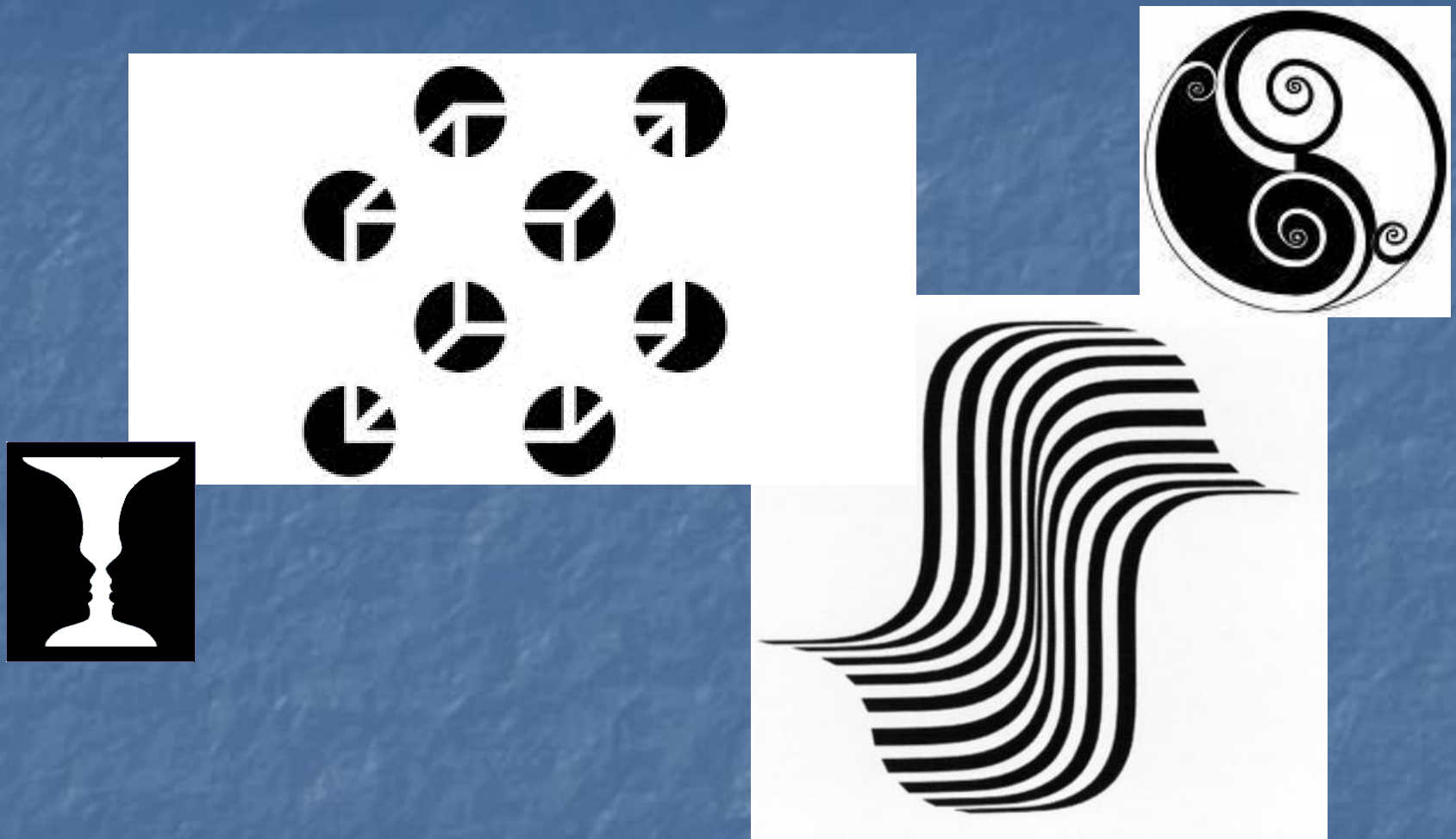


Diferentes modos que se propagan por las fibras

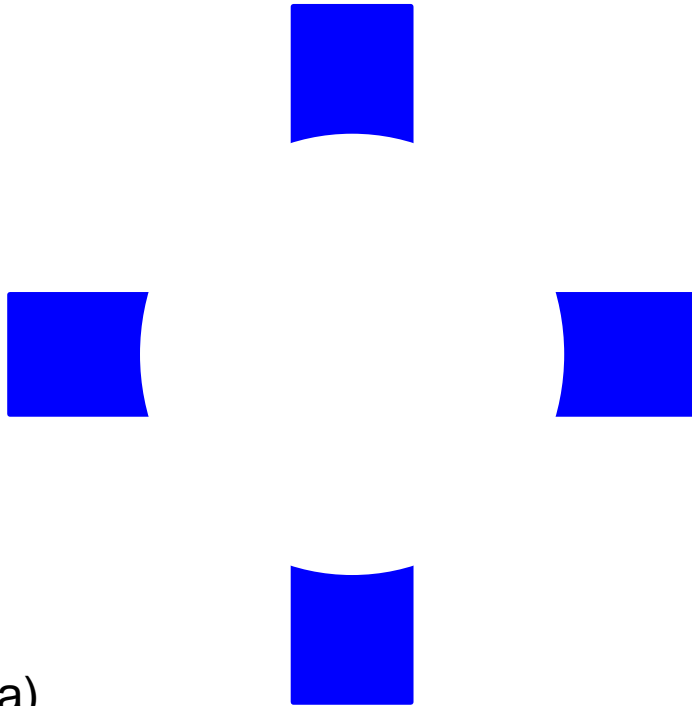


Fibra de entrada

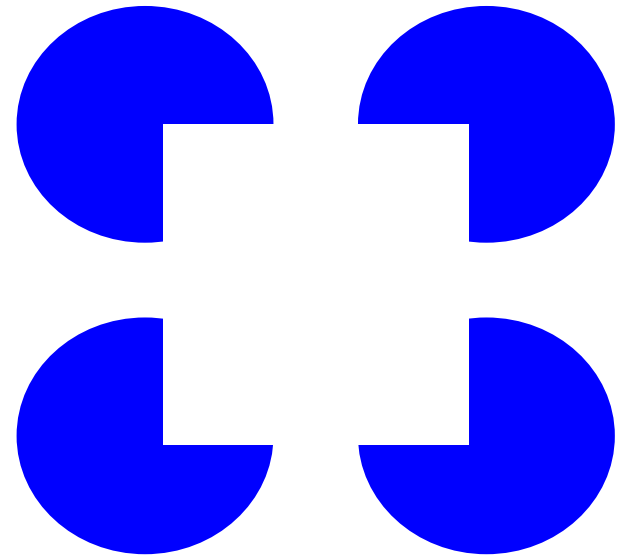




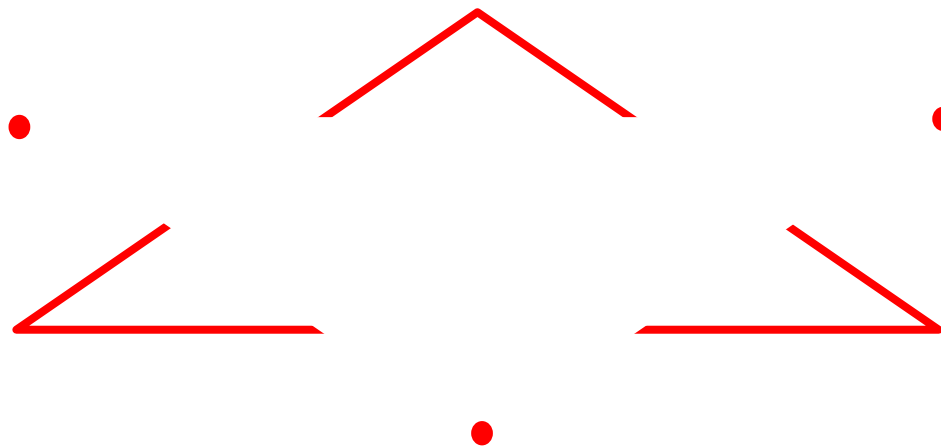
# MULTIESTABILIDAD



(a)



(b)

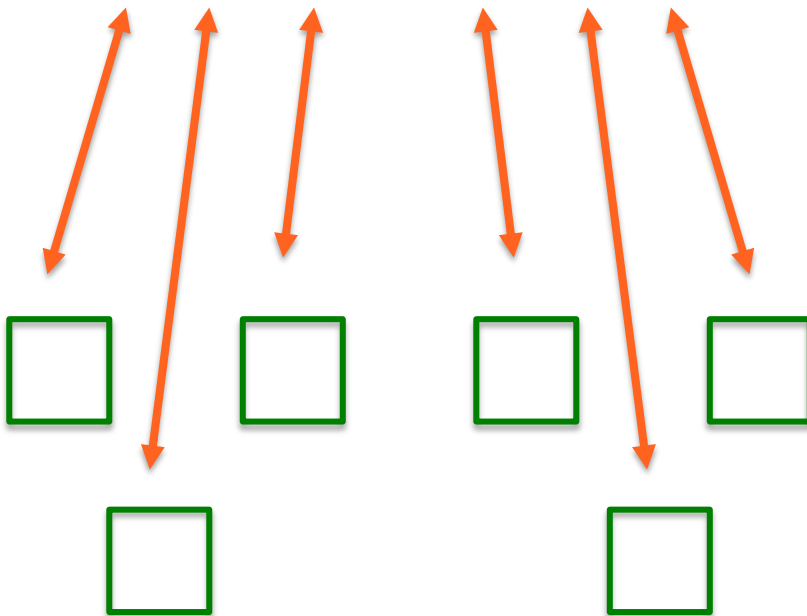


(c)



## Formación de la imagen

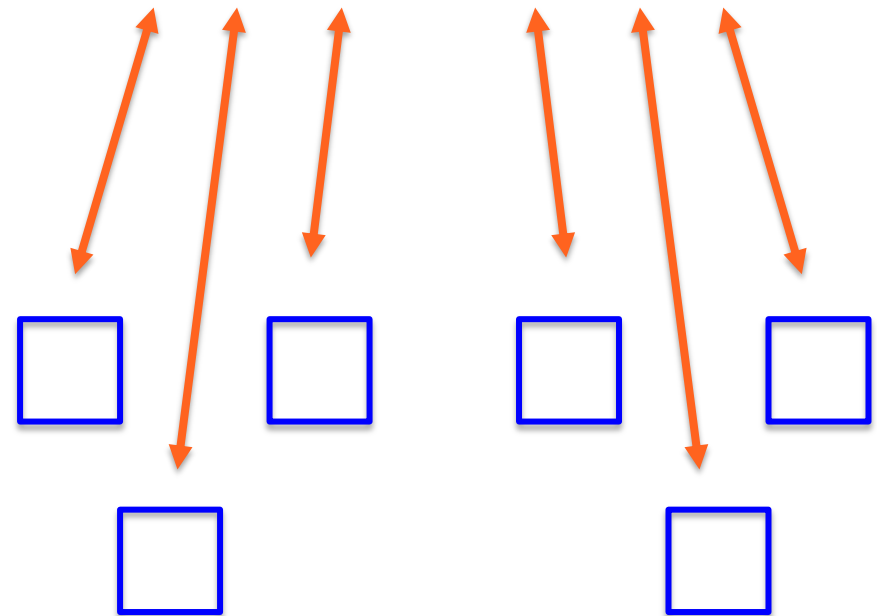
**Parámetro de orden**



**Subsistemas**

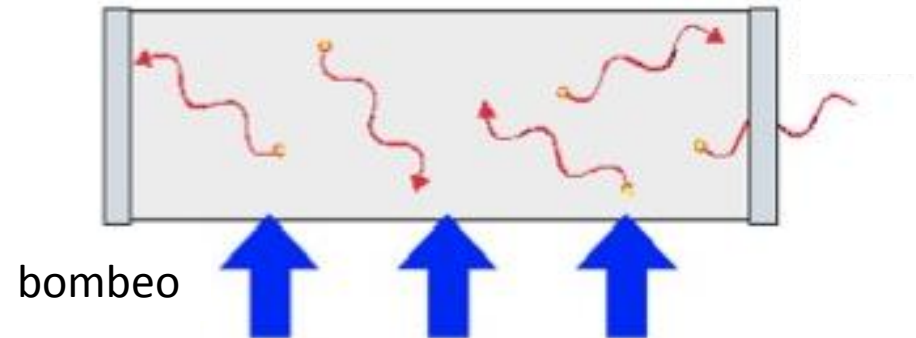
## Reconocimiento de la imagen

**Parámetro de orden**

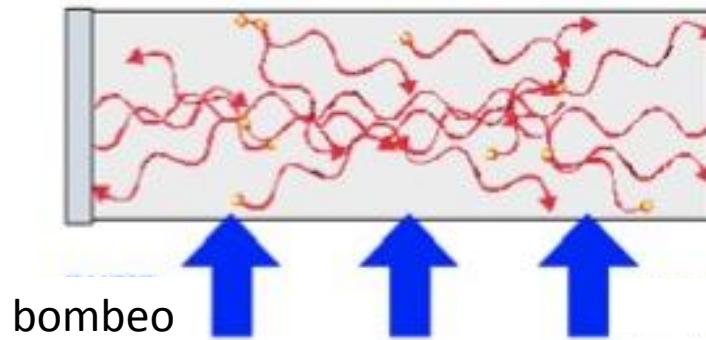


**Características**

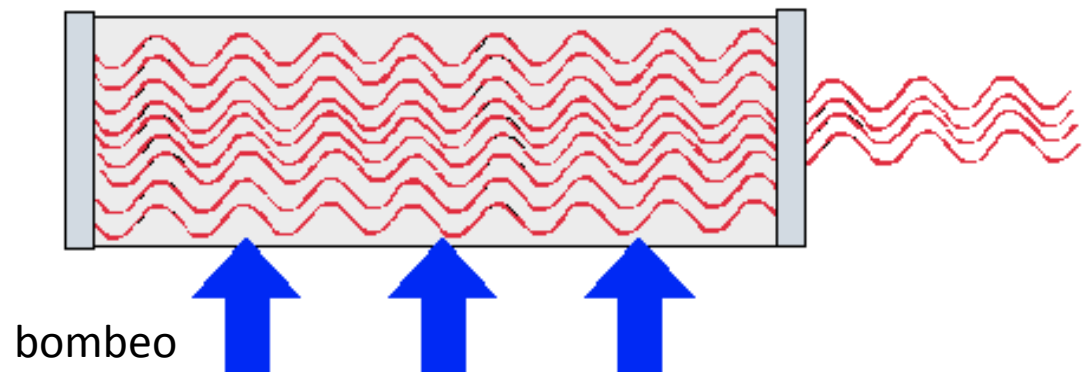
Emisiones espontáneas



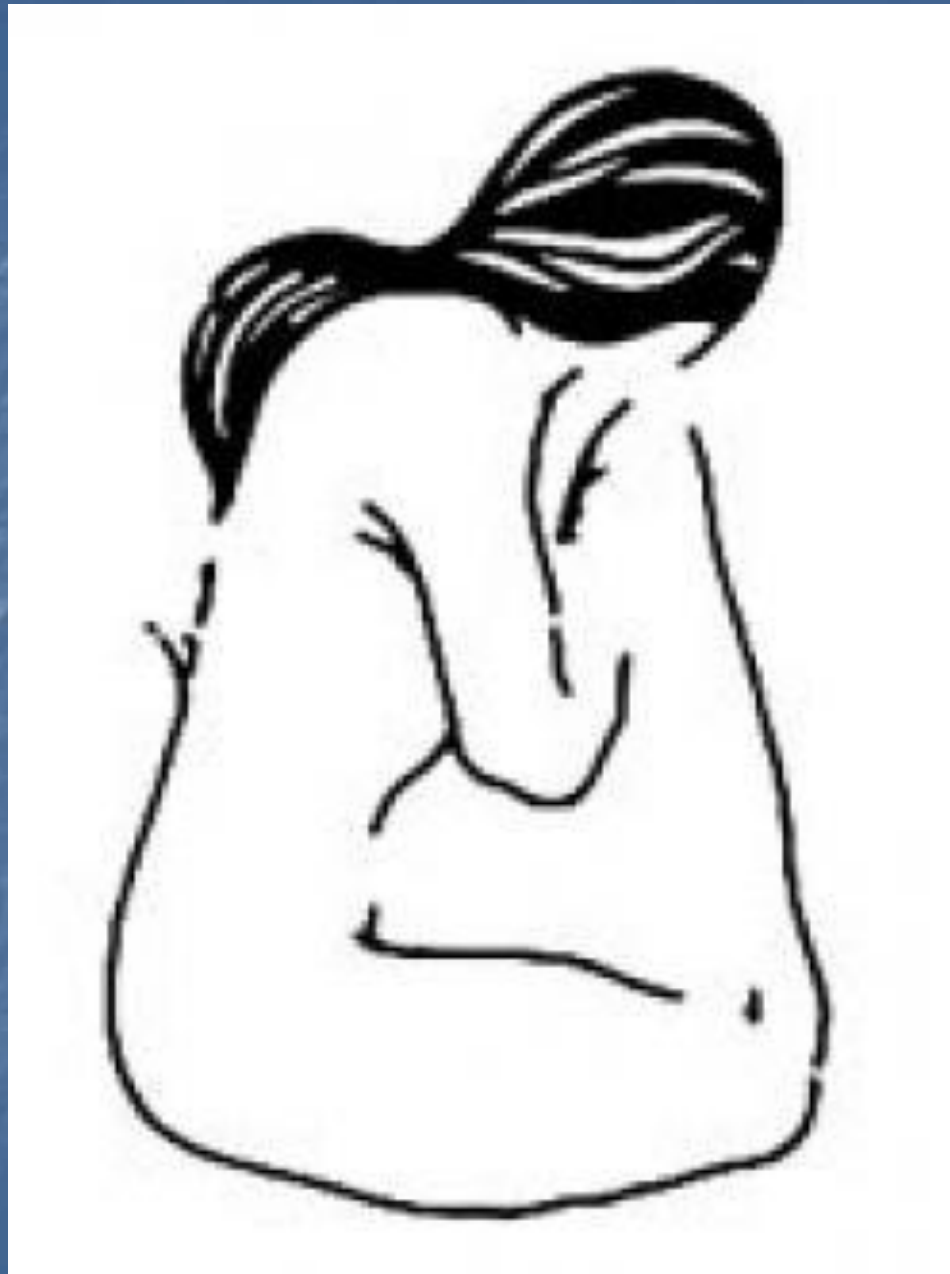
Emisiones espontáneas y estimuladas



Emisiones estimuladas





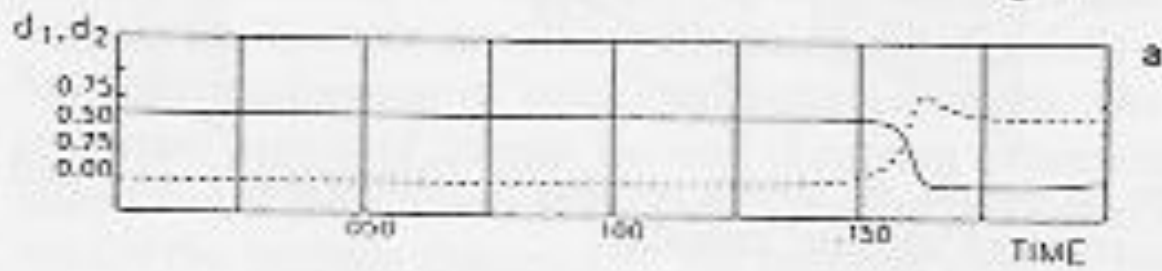


G.H.Fischer



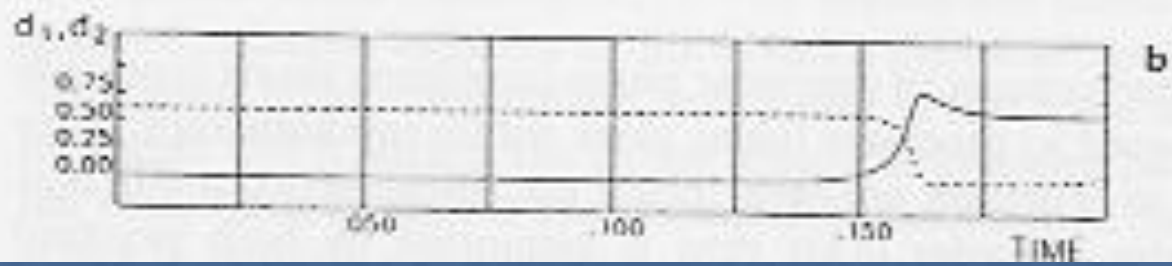
face

girl

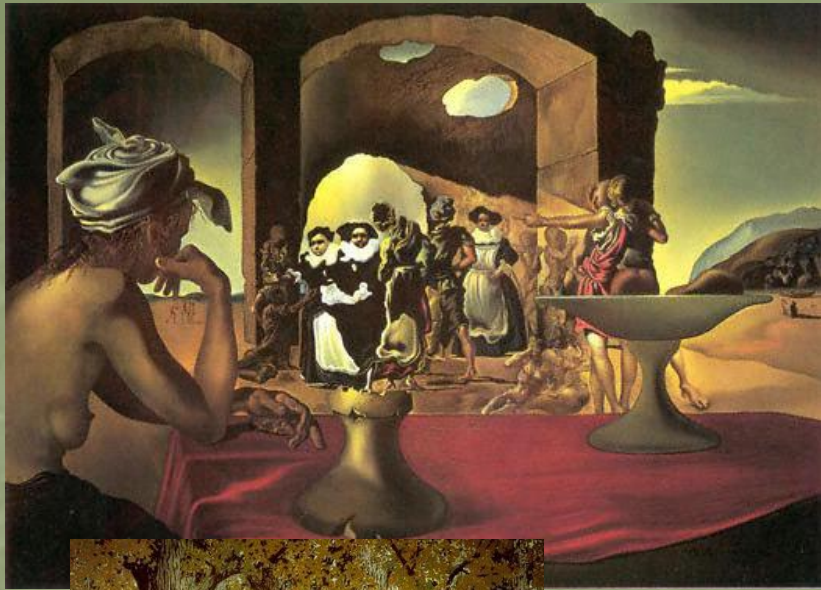


girl

face





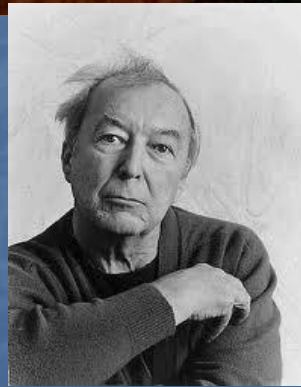
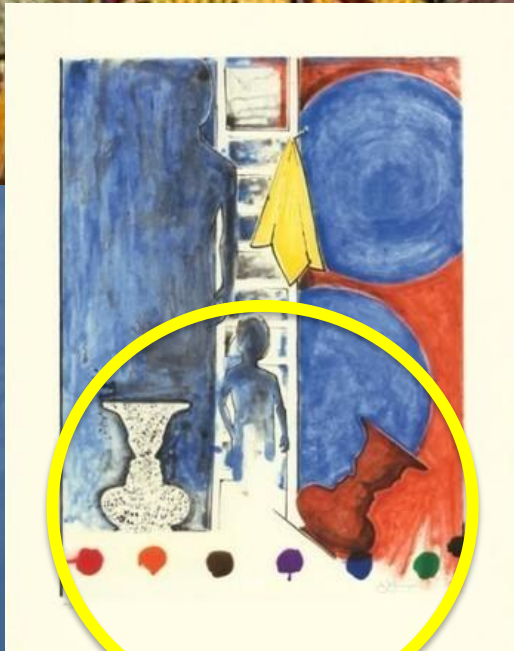


Dalí



Magritte





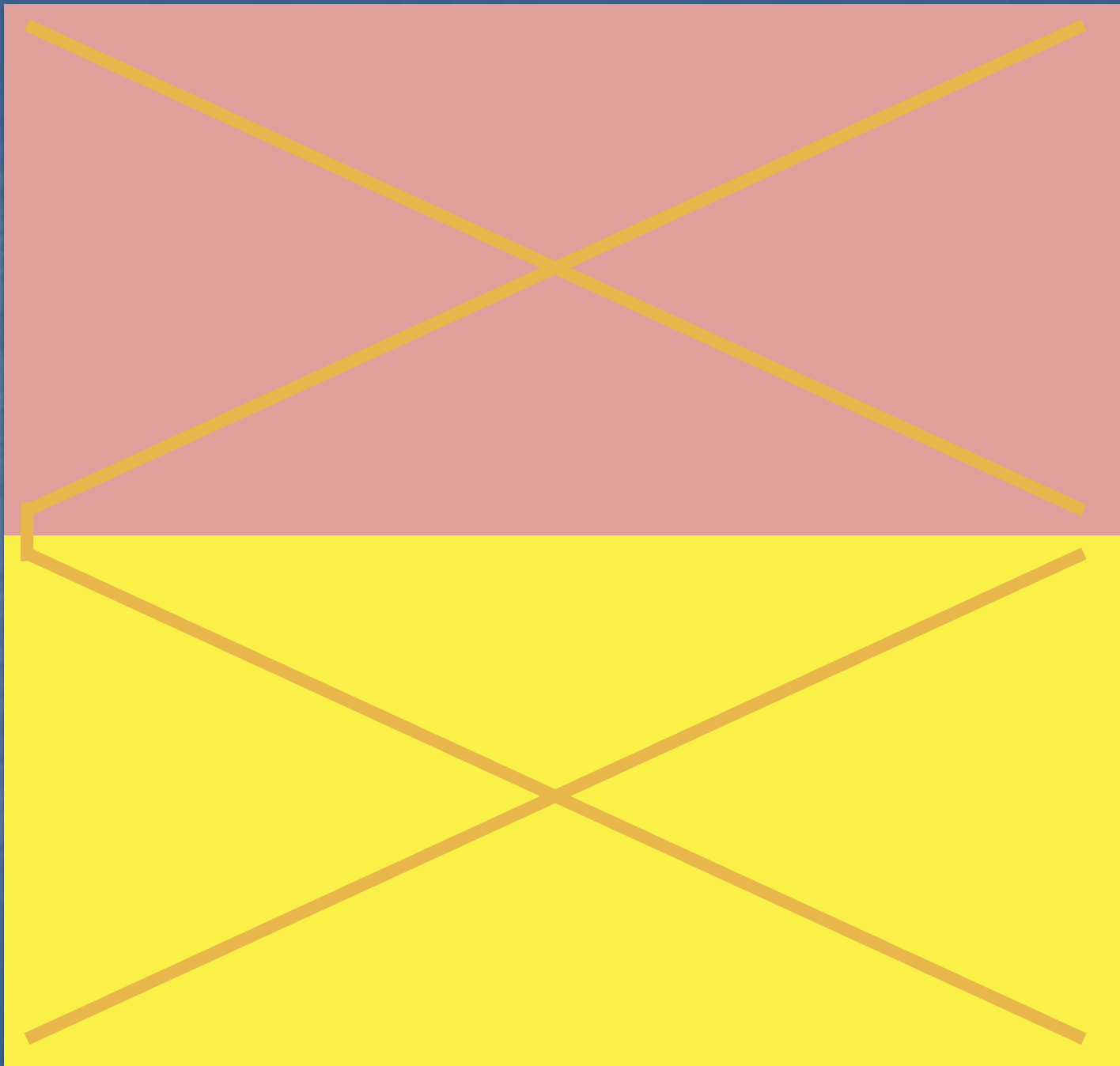
Jasper Johns  
(1930 )





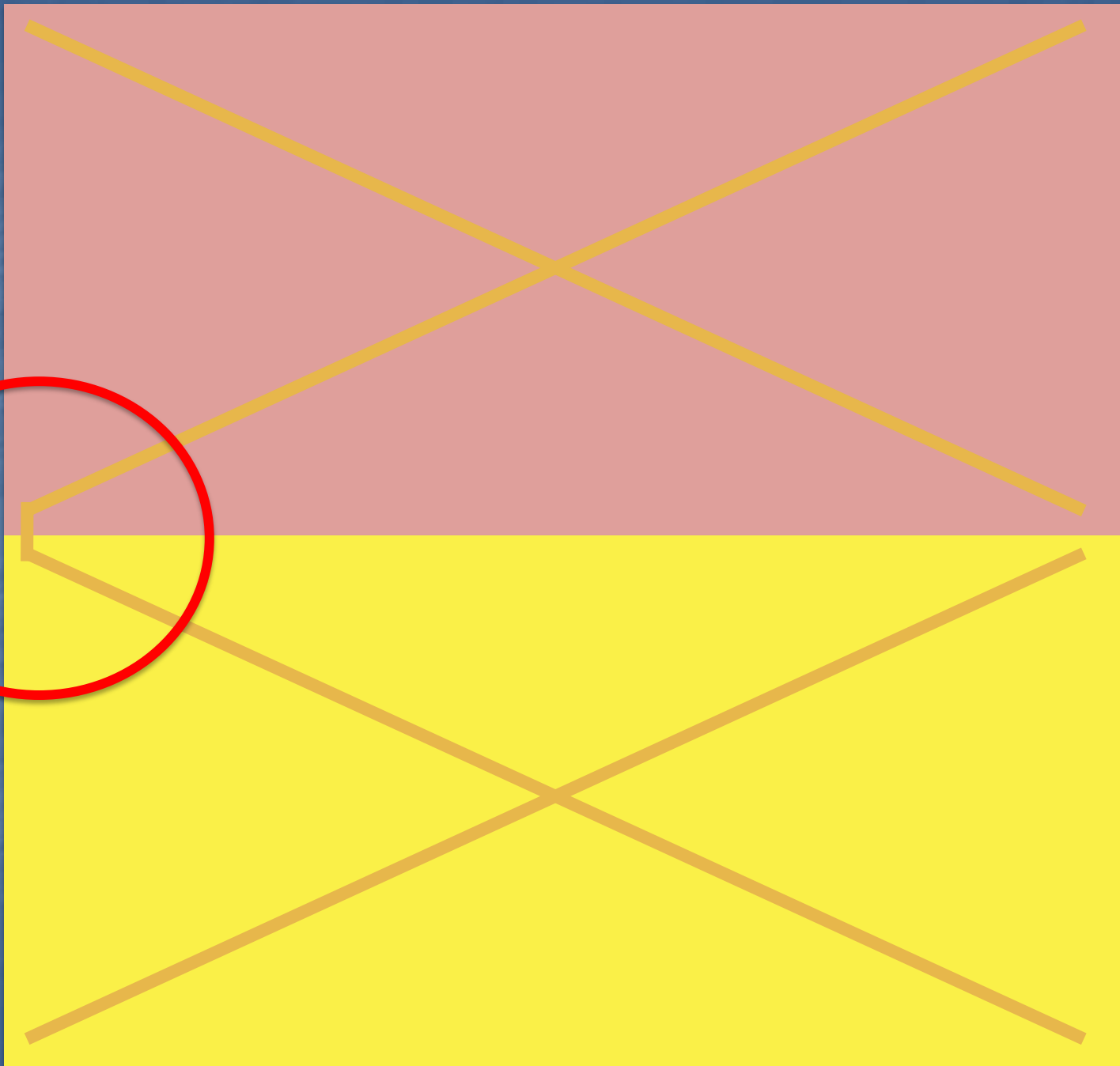
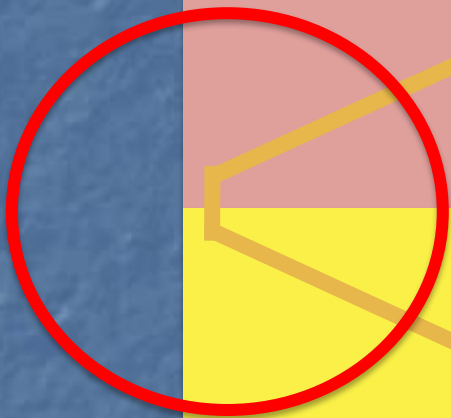
The background is a vibrant, pixelated rainbow gradient. The colors transition from red on the left, through orange, yellow, green, blue, and purple on the right. The word "COLOR" is centered in the image, with each letter colored to match the background gradient: 'C' is blue, 'O' is green, 'L' is yellow, 'O' is orange, and 'R' is red.

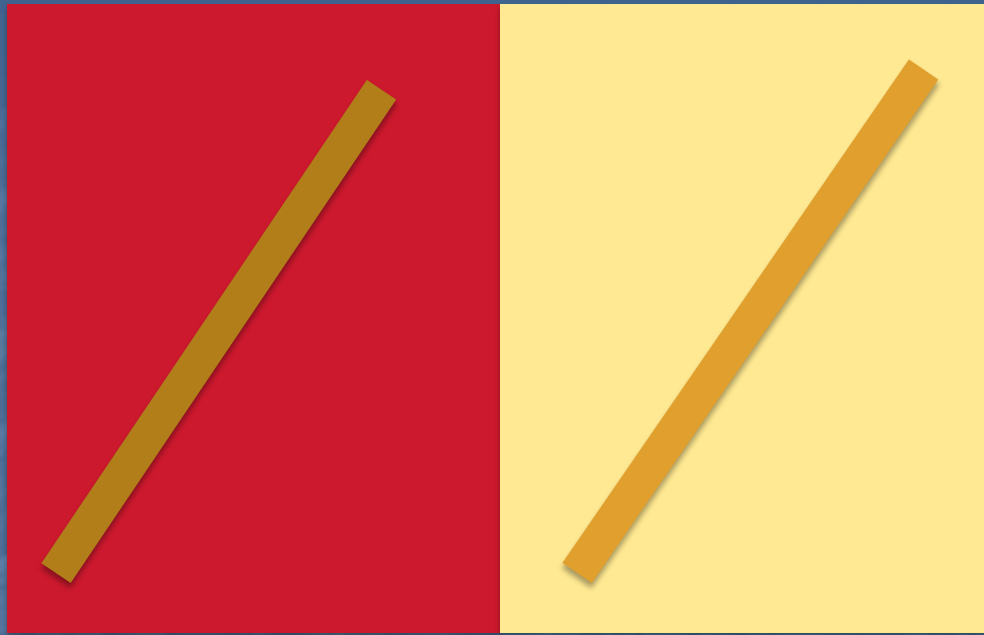
COLOR



Albers



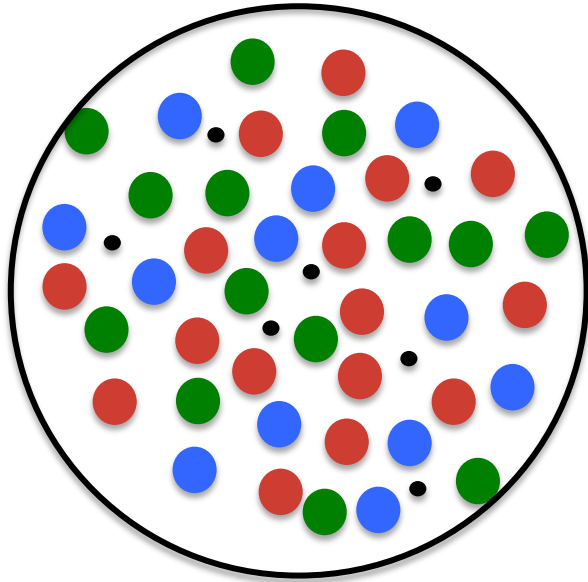




Albers



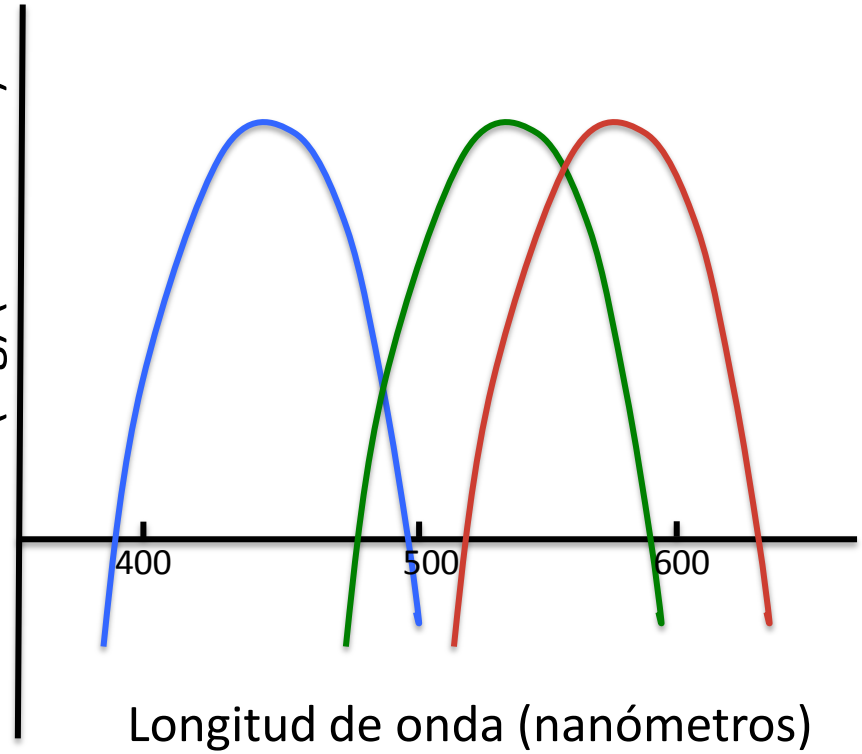
• bastón

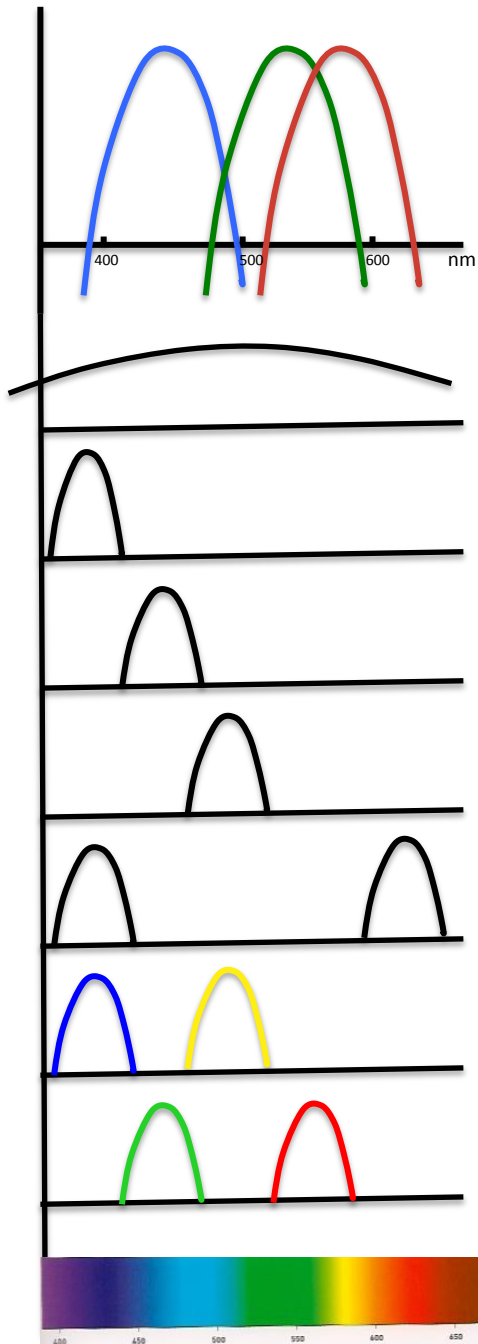


(a)

(b)

Absorción de la sensibilidad de los  
conos (log) (unid. arb.)





**Conos  
activados**

**Sensación**

Azul, verde, rojo

Blanco

Azul

Violeta

Azul, verde

Azul cian

Verde, rojo

Amarillo

Azul, rojo

Púrpura

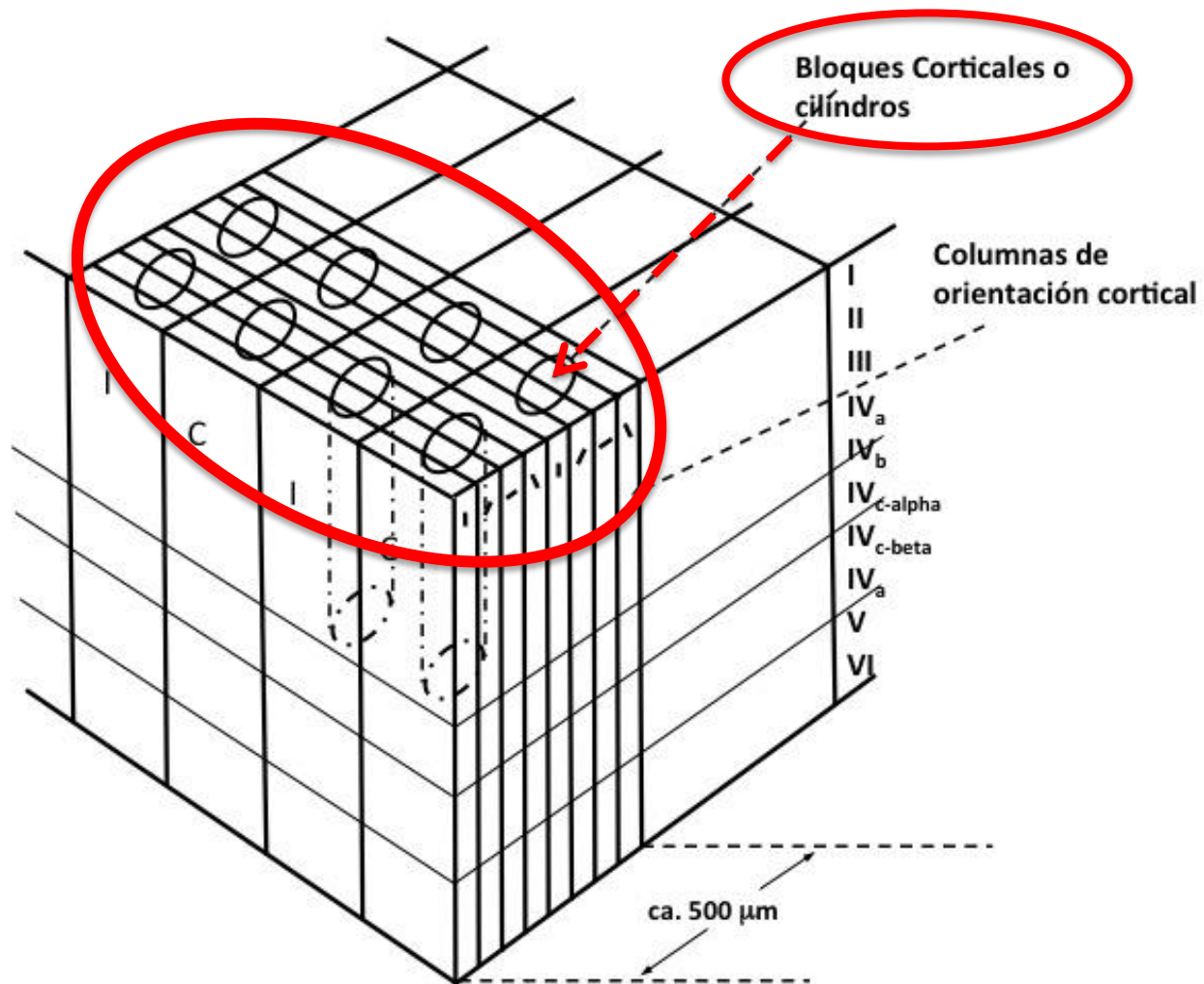
Azul, verde, rojo

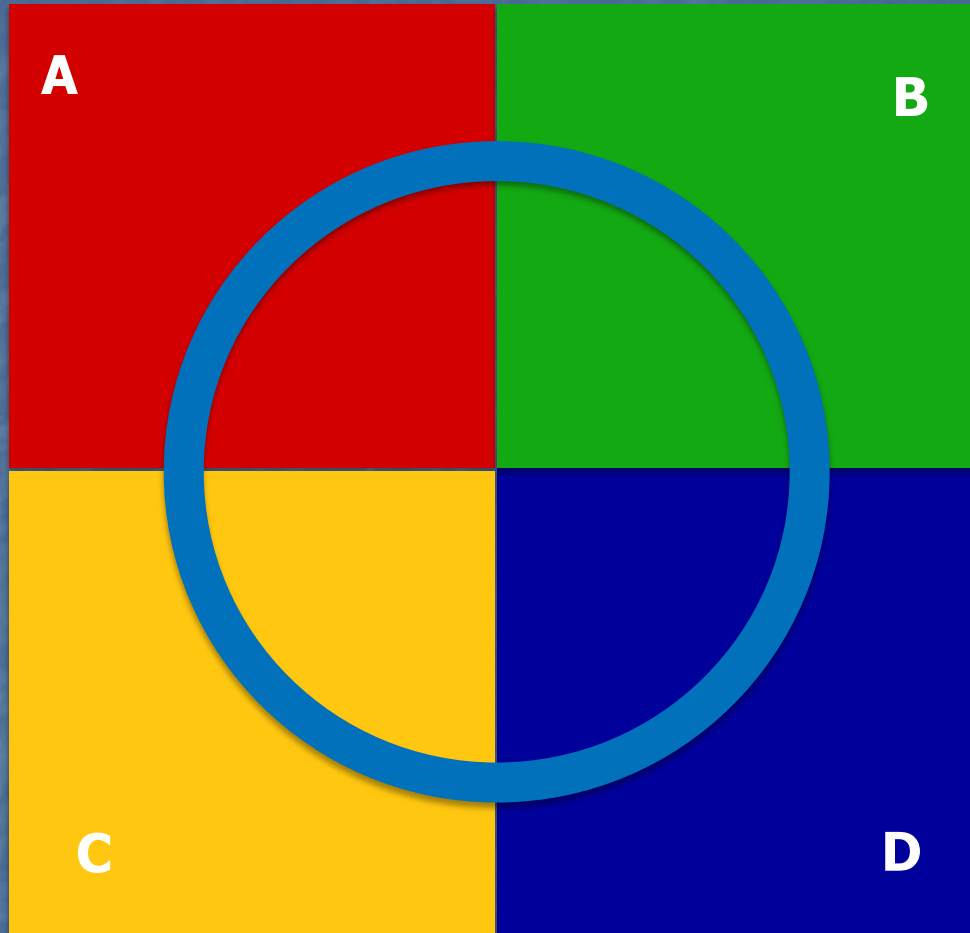
Blanco

Azul, verde, rojo

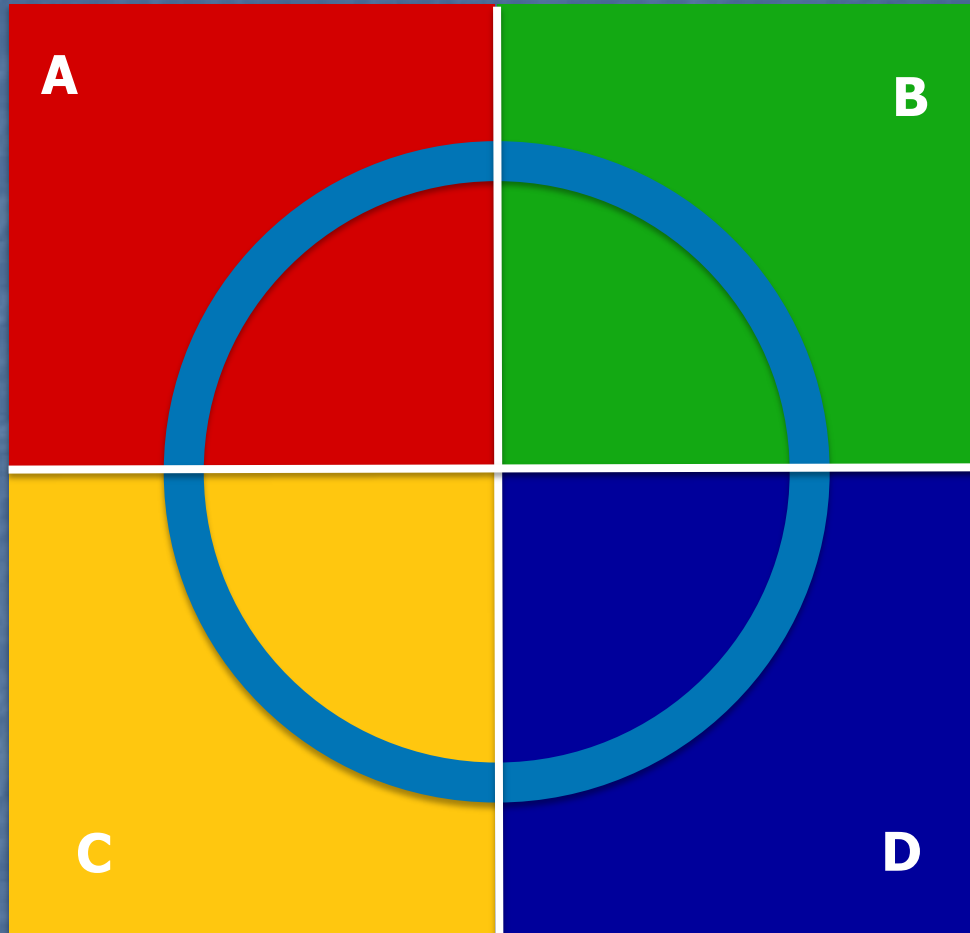
Blanco

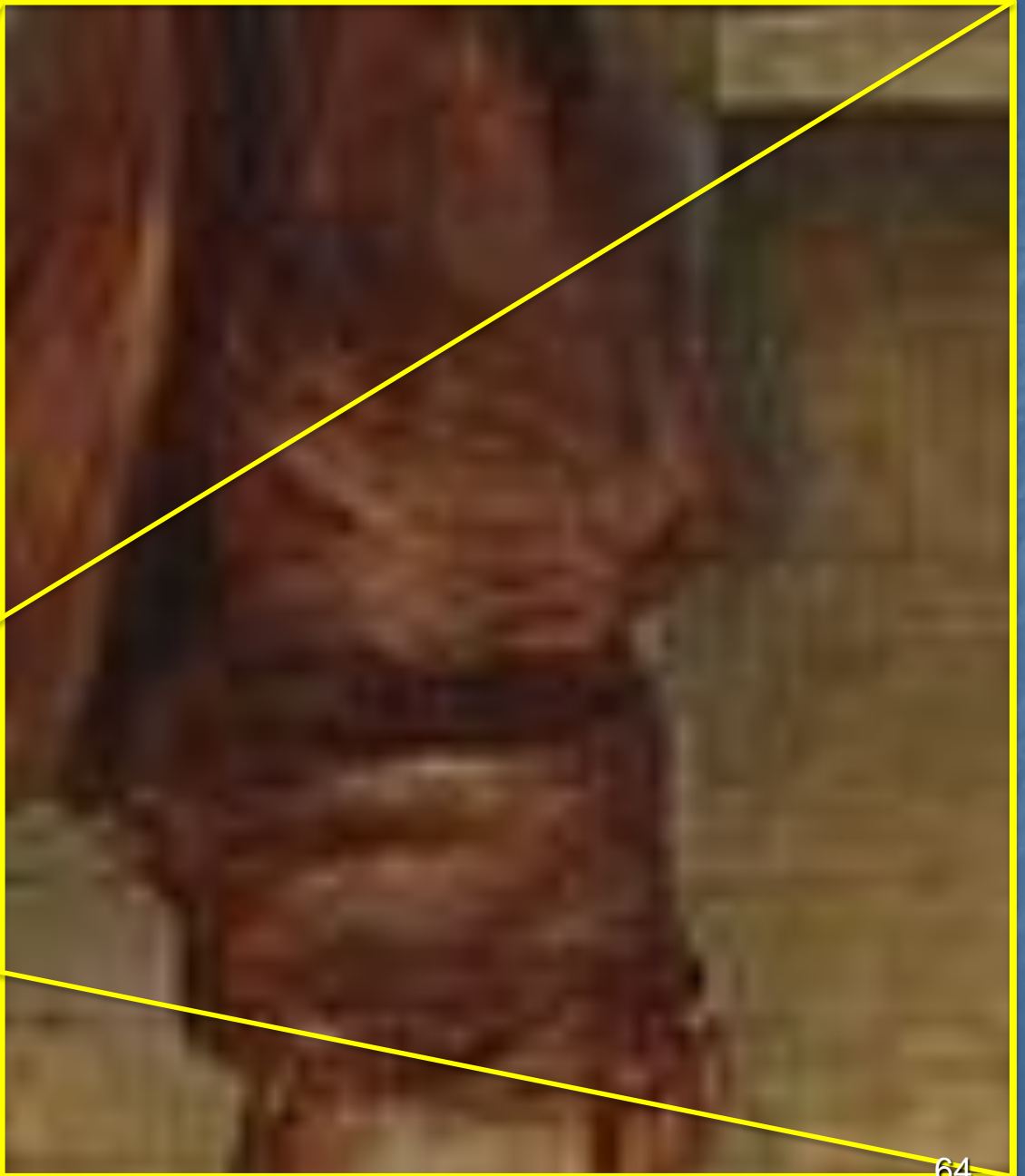
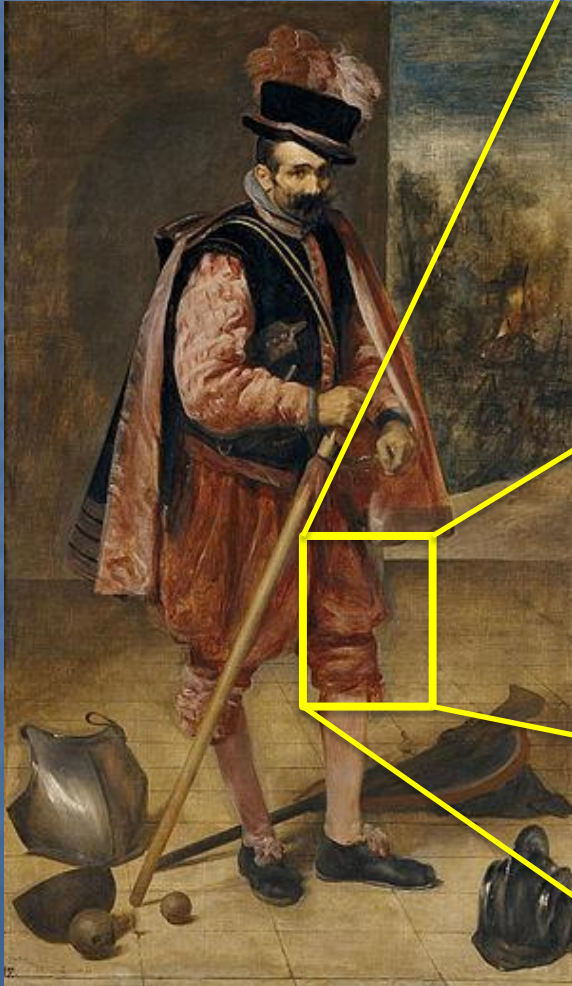






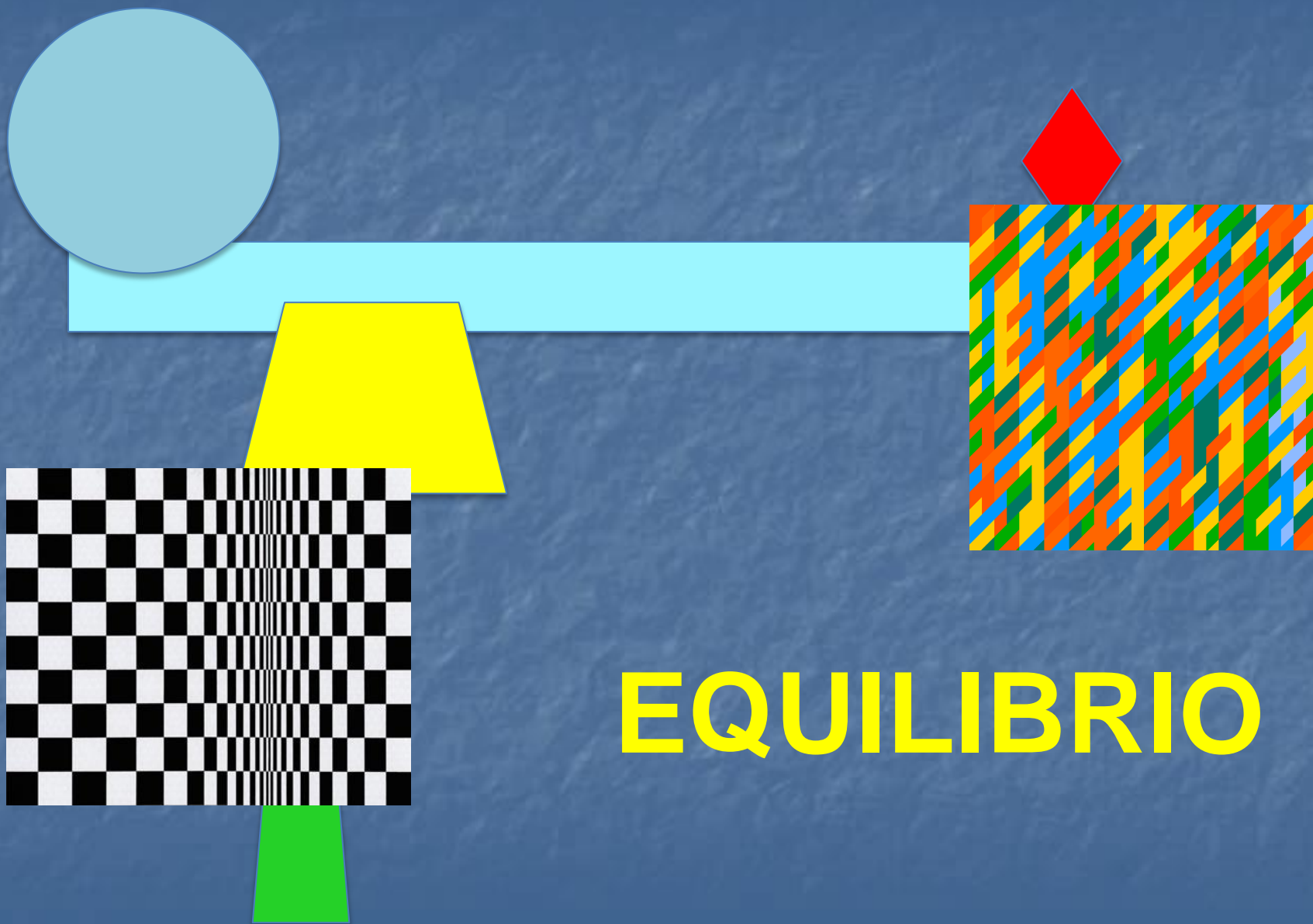






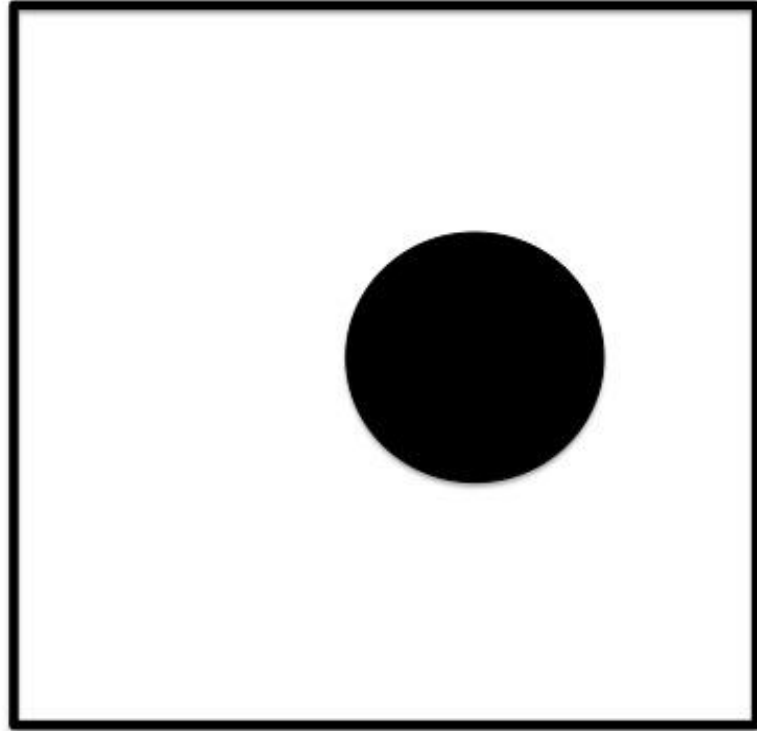






**EQUILIBRIO**

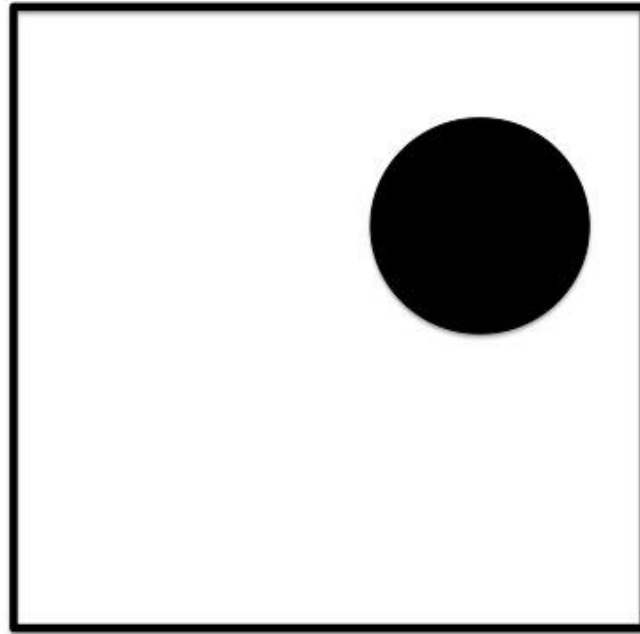




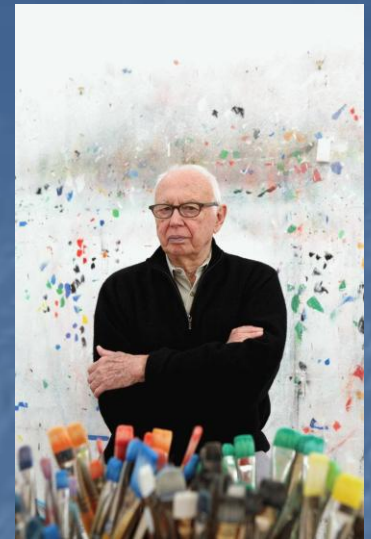
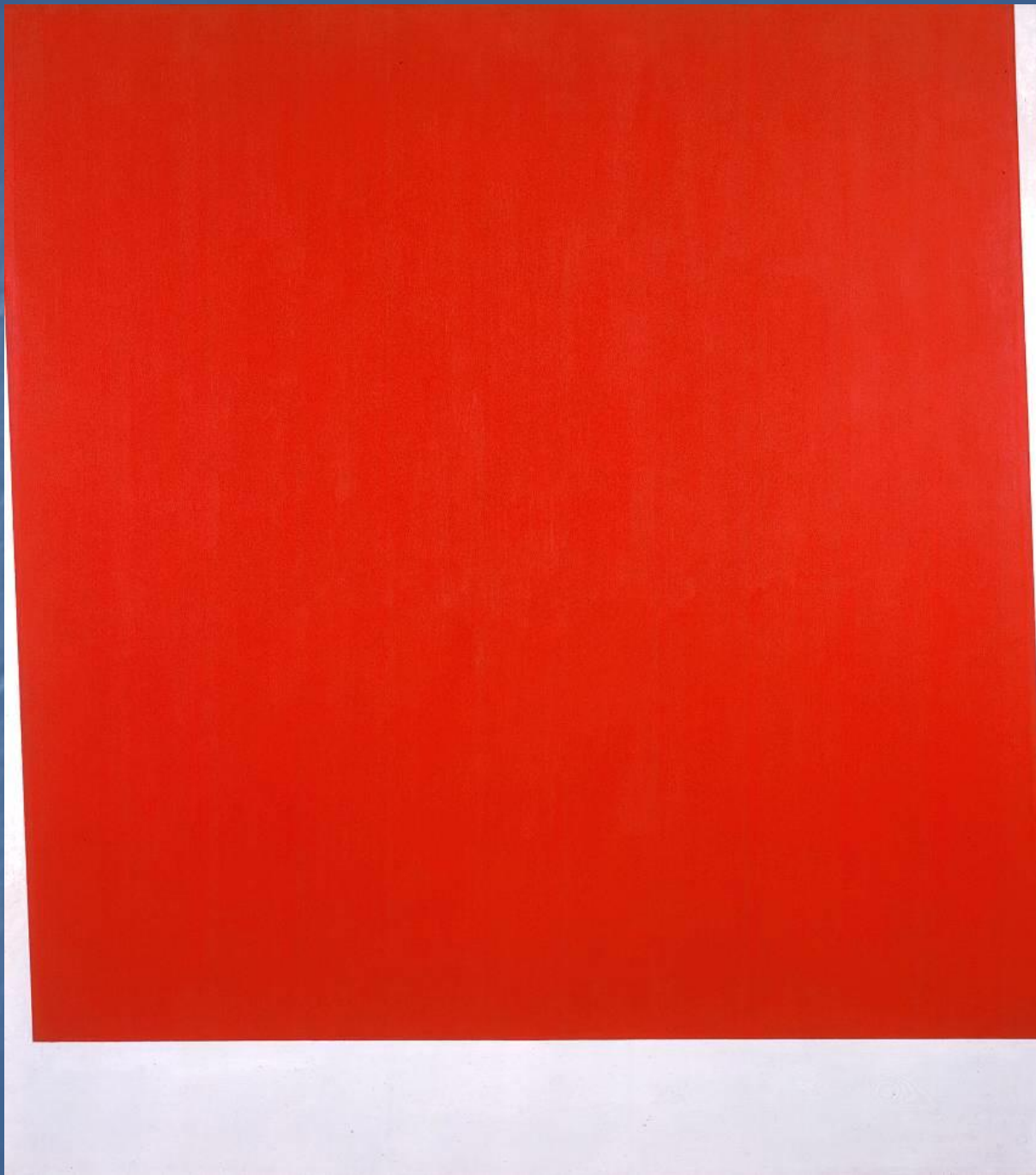












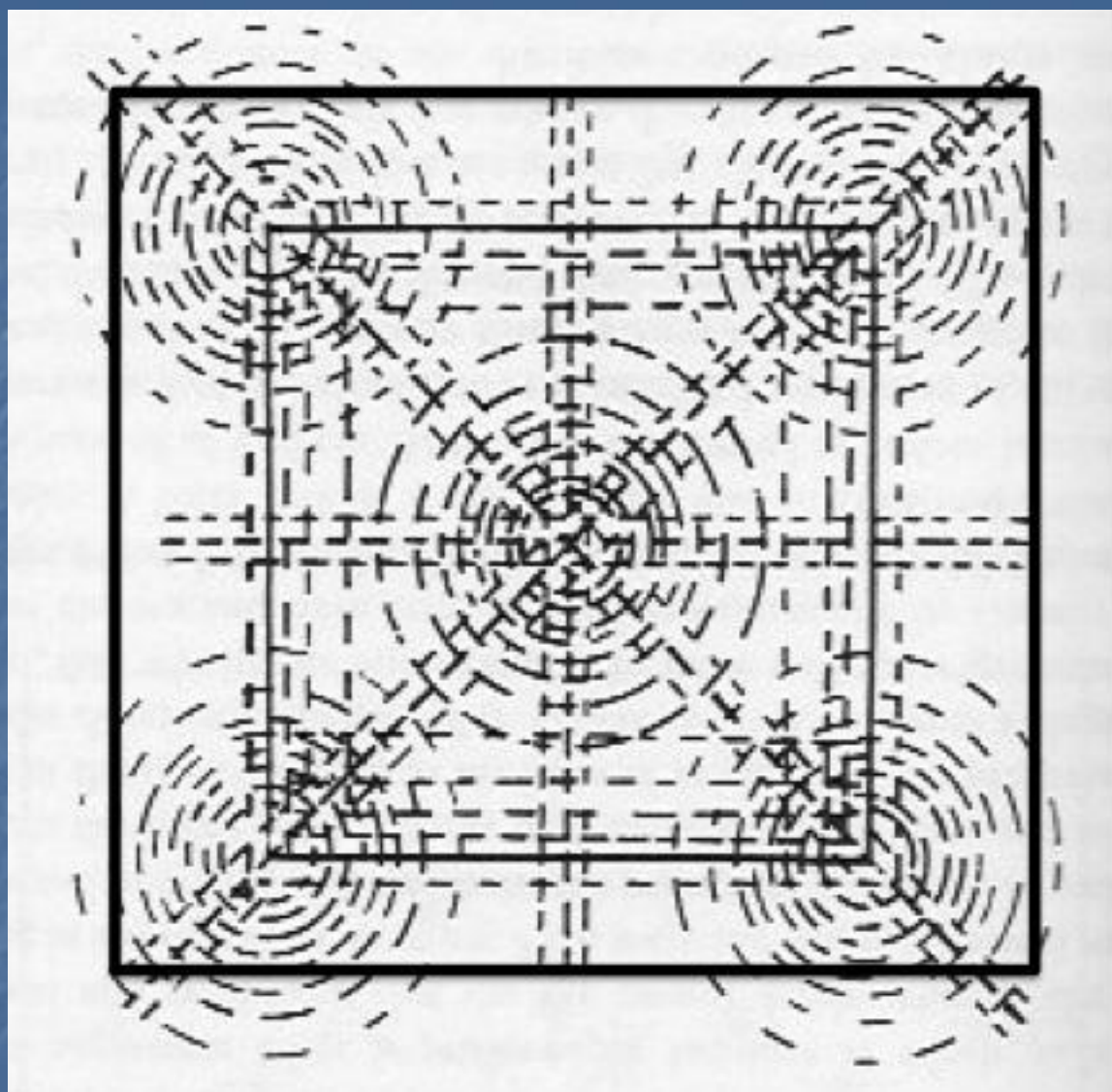
Ellsworth Kelly  
(1923)

***Broadway***

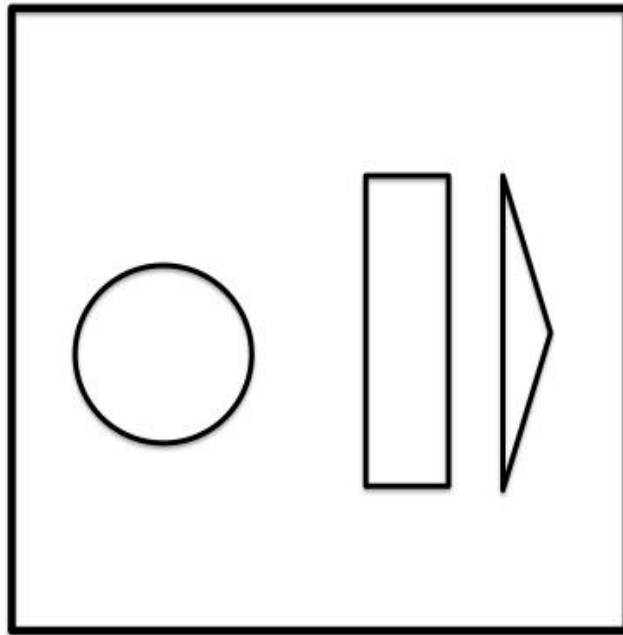
1958

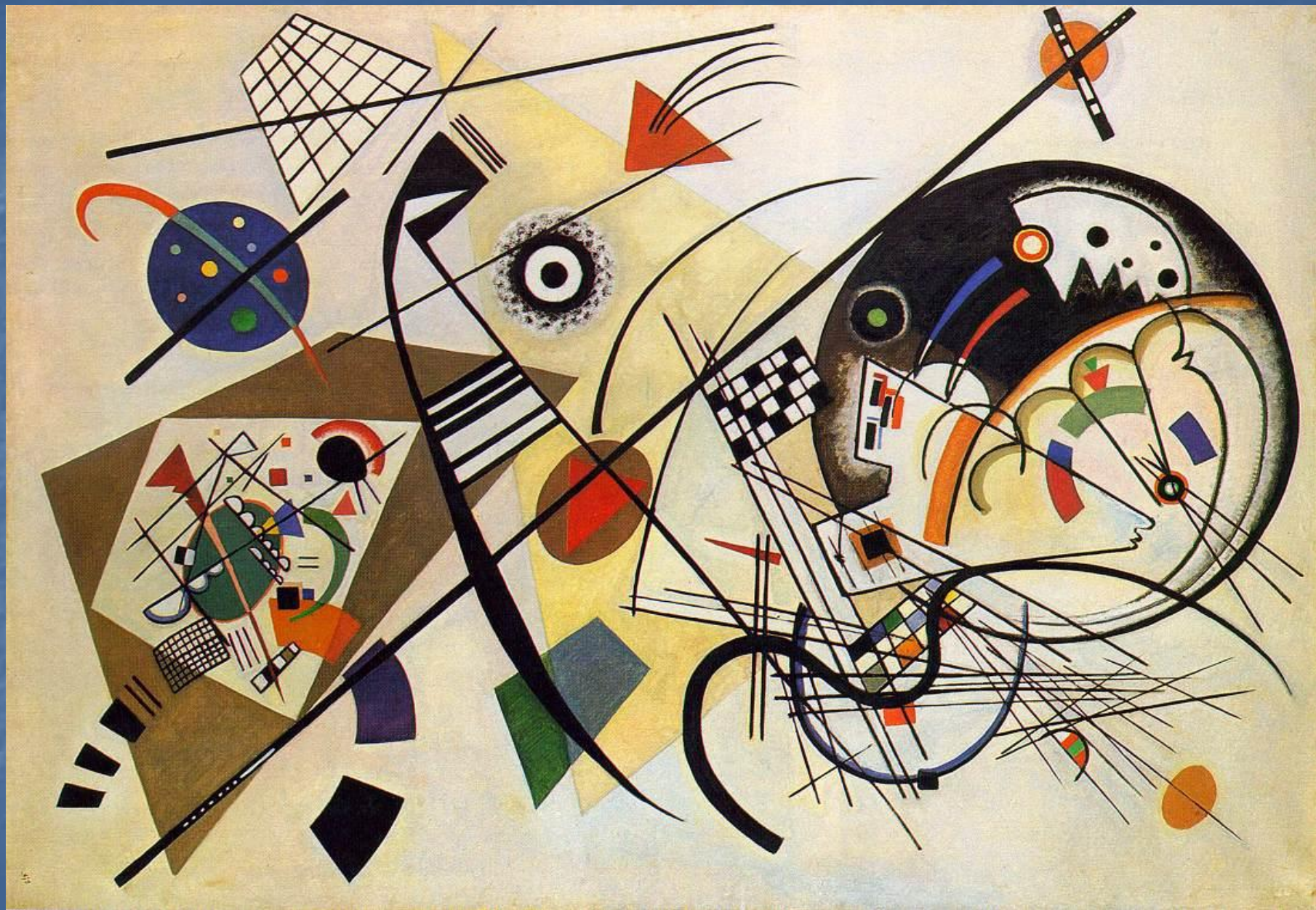
1982 x 1767 x 28 mm

Tate

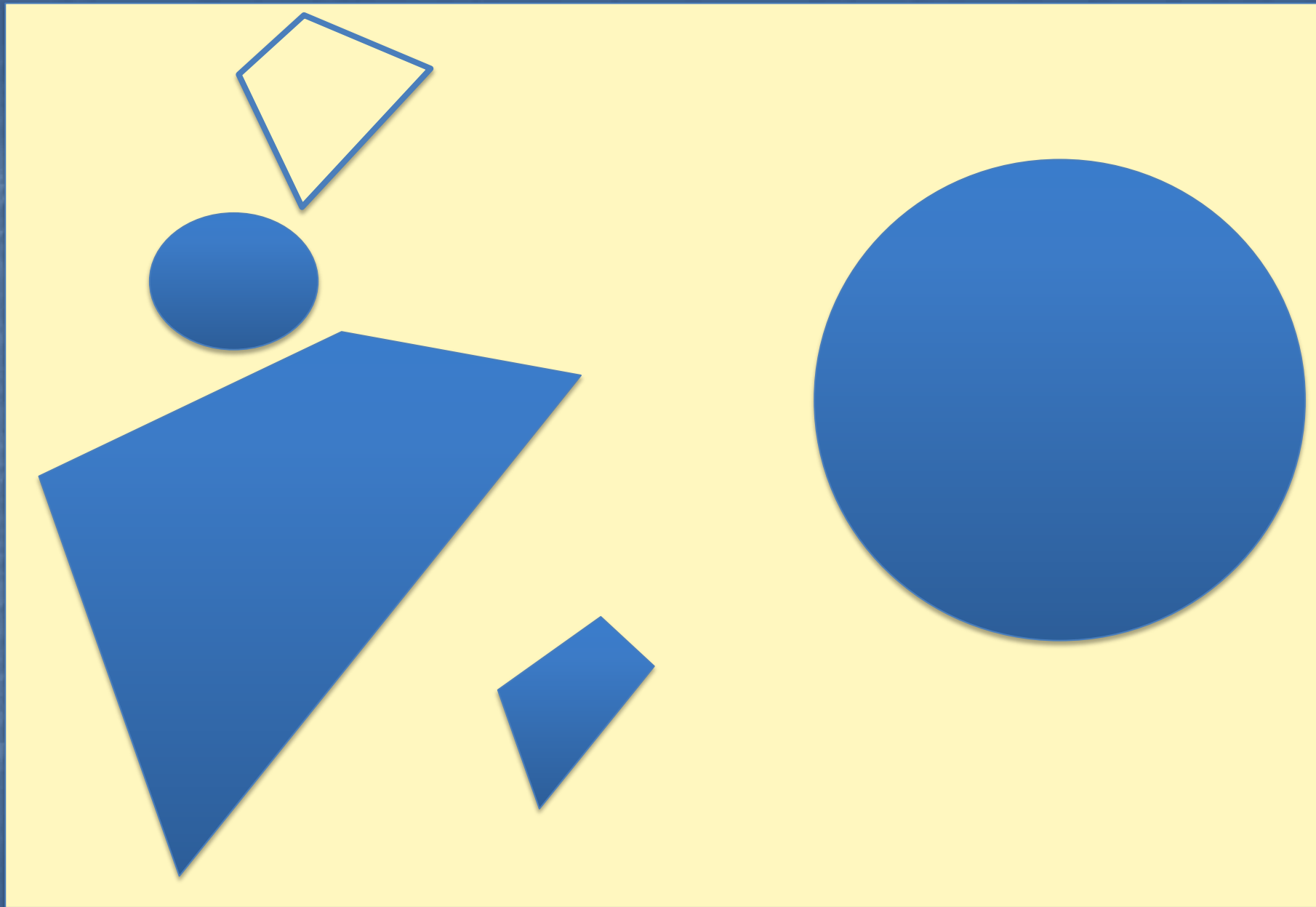


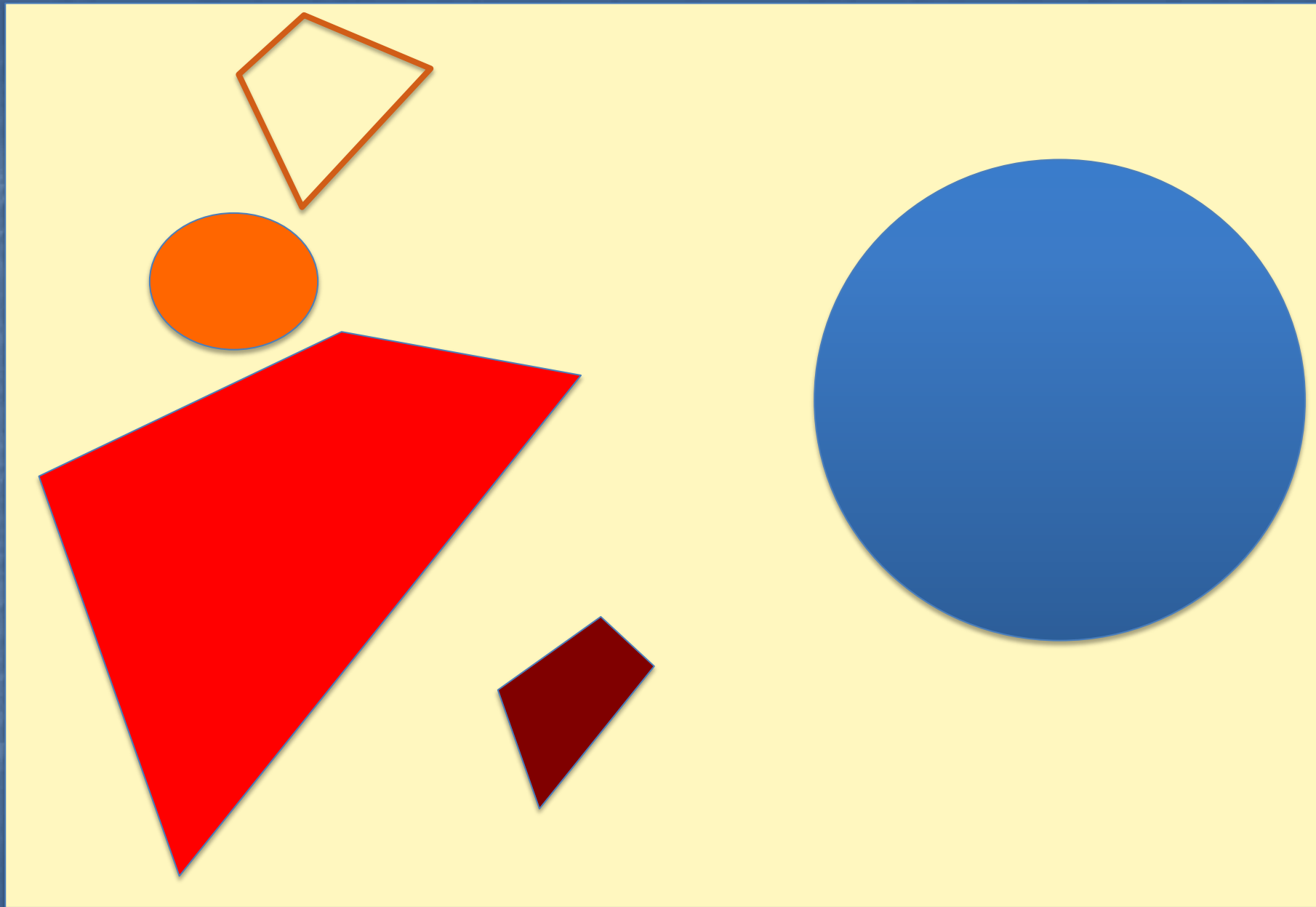










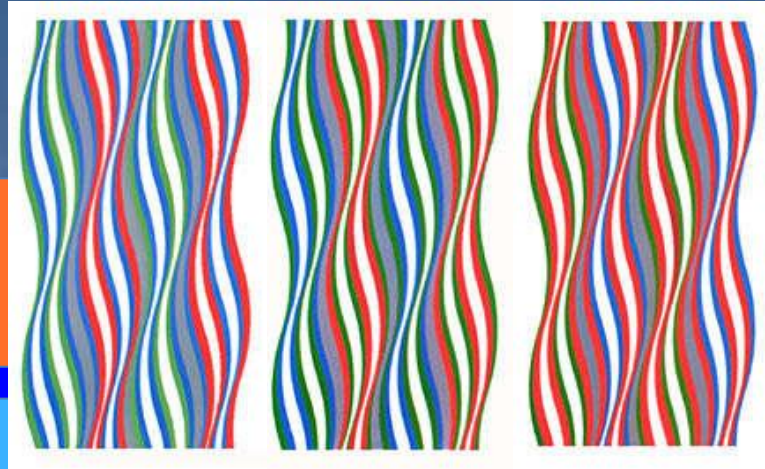












# DIVERTIMENTO FINAL







# Rafael











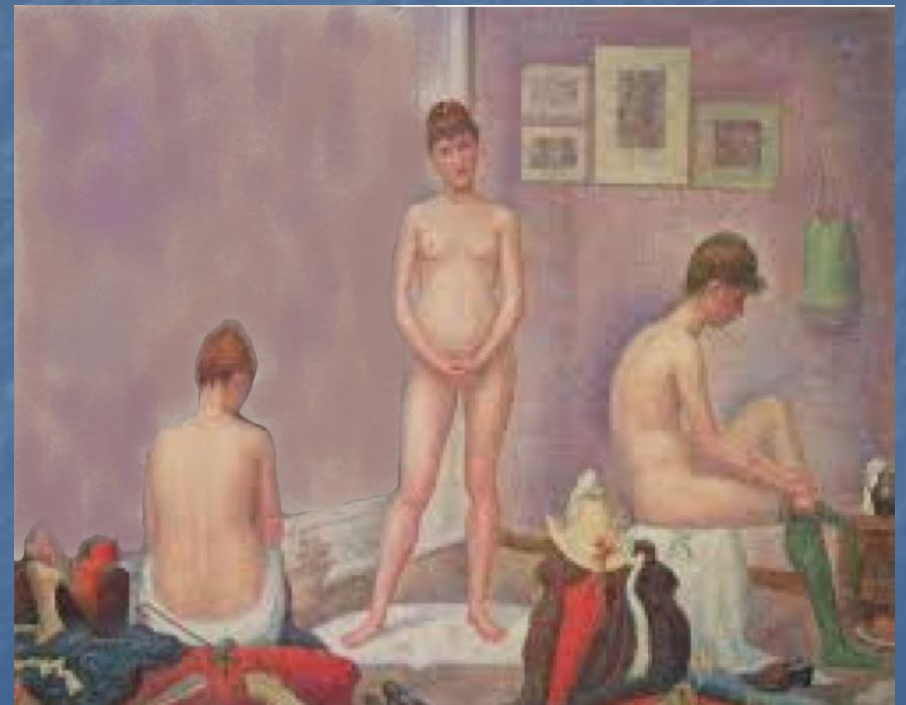




Seurat









Kandinsky











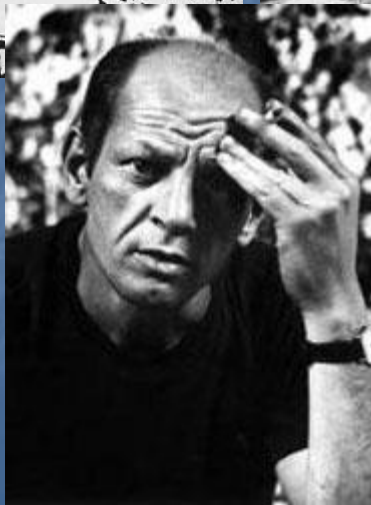


Pollock

***Autumn Rhythm***  
1950







Paul Jackson Pollock  
(1912-1956)





Helen Frankenthaler  
(1928 – 2011)





**MUCHAS  
GRACIAS**

